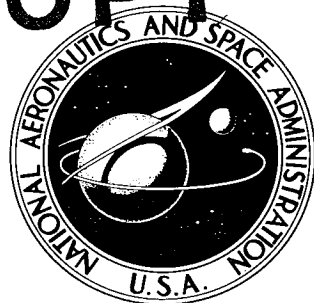


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## CALCULATION OF TRANSPORT PROPERTIES OF IONIZING ATOMIC HYDROGEN

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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## SUMMARY

The viscosity, thermal conductivity, electrical conductivity, binary diffusion coefficient, multicomponent diffusion coefficient, and thermal diffusion coefficient are calculated for equilibrium ionizing atomic hydrogen for temperatures from 5000° to 40 000° K at pressures from  $10^{-5}$  to  $10^2$  atmospheres. Rigorous first- and second-approximation equations are used throughout. The collision cross section for all the interactions are presented in tabular form.

## INTRODUCTION

In recent years considerable interest has developed in the transport properties of gases at temperatures sufficiently high for dissociation and ionization to be important. In this temperature range experimental measurements are difficult, if not impossible, and the most accurate sources of information at present are theoretical calculations based on equations obtained from kinetic theory. The transport properties of hydrogen in the temperature range where dissociation is important are calculated in references 1 and 2. No ionization of hydrogen was considered in these calculations. In this report, the transport properties of ionizing atomic hydrogen are calculated. Rigorous first- and second-approximation equations based on the moment method and the Chapman-Enskog method of solving the Boltzmann equation are used. A critical evaluation of these approximations is discussed by Ahtye (ref. 3) and DeVoto (ref. 4).

The calculations are made for pressures ranging from  $10^{-5}$  to  $10^2$  atmospheres and temperatures ranging from 5000° to 40 000° K. As is shown in the following paragraph, these calculations may be thought of as an extension of the results of references 1 and 2 to higher temperatures.

An estimate of the range of pressures and temperatures where references 1 and 2 and the present results are valid may be made from figure 1, where one of the two curves corresponds to temperatures and pressures where the mole fraction of molecular hydrogen is  $5 \times 10^{-4}$  and the other corresponds to temperatures and pressures where the mole fraction of atomic hydrogen ions is  $5 \times 10^{-4}$ . Results of references 1 and 2 should be valid in region I of figure 1, and the present results should be valid in region II. The shaded region is the overlap region where dissociation and ionization reactions should be considered simultaneously. Even in this region, however, the mole fraction of molecular hydrogen is always

less than 0.02, and the data of references 1 and 2 may be faired smoothly into the present results. To show this, the thermal conductivity was calculated for temperatures between 5000° and 15 000° K at a pressure of  $10^2$  atmospheres including both dissociation and ionization. The results, together with the data from reference 1 and the present calculation, are plotted in figure 2. It is seen that only a small error would be introduced if a smooth curve is drawn to connect the results of reference 1 to the present results. The thermal conductivity was chosen for the illustration since it is the transport property most sensitive to chemical reactions. A pressure of  $10^2$  atmospheres was chosen because it has the largest range of temperatures where both dissociation and ionization occur simultaneously.

Yos (ref. 5) has calculated the transport properties of ionizing hydrogen for pressures of 1, 3, 10, and 30 atmospheres and temperatures up to 30 000° K. The present calculation differs from that of Yos in that rigorous equations are used throughout, additional transport coefficients were calculated, and the calculations were made over a wider temperature and pressure range. Also, in the present calculation of the thermal conductivity, an additional term  $\lambda_d$  is included.

#### ASSUMPTIONS

The calculations made in this investigation are based on the following assumptions:

- (1) The ideal gas law is valid for an ionized gas.
- (2) The number of neutral hydrogen atoms in the excited states are negligible.
- (3) The first-approximation equations for viscosity and the second-approximation equations for translational thermal conductivity, binary diffusion coefficient, thermal diffusion coefficient, electrical conductivity, and multi-component diffusion coefficients are valid.
- (4) The contribution to the thermal conductivity due to chemical reaction may be calculated by the expression given by Butler and Brokaw (ref. 6) with the use of the multicomponent diffusion coefficient as suggested in reference 7.

#### Validity of Assumptions

Zelevnik and Gordon (ref. 8) have investigated the deviation of a plasma from ideal gas behavior. They present their results so that the deviation of the compressibility factor  $Z$  (equal to  $pV/RT$ ) from unity indicates the departure from ideal behavior. (All symbols are defined in appendix A.) Using their expression to calculate  $Z$  at a temperature of 20 000° K and a pressure of  $10^2$  atmospheres gave a value of approximately 1.01. Since the correction factor for  $Z$  decreases for increasing temperatures and decreasing pressures, it is expected that the gas will deviate less than 1 percent from ideality for most of

the conditions calculated. Then, assumption (1) is a good approximation.

With regard to assumption (2), Rosenbaum and Levitt (ref. 9) show that, for hydrogen gas at temperatures less than  $20\,000^{\circ}\text{K}$  and pressures of  $10^2$  atmospheres or less, the contribution of the excited states to the atom partition function is negligible compared with the ground-state contribution. Since the concentration of hydrogen atoms is less than 0.1 percent for temperatures greater than  $20\,000^{\circ}\text{K}$ , it is expected that the atoms in the excited states will contribute a negligible amount to the transport coefficients.

An estimate of the error introduced by assumption (3) may be obtained from reference 4, in which equations to the fourth approximation are given for all the transport coefficients except viscosity, where only the second approximation is given. Also, the deviation of the higher approximations from the first approximation for a completely ionized binary gas for several ion to electron mass ratios is included. For an ion to electron mass ratio of 1836 (hydrogen), the first approximation for the viscosity and the second approximation for the other coefficients, except the translational thermal conductivity were within 15 percent of the higher approximations. The values obtained by using the third approximation for the translational thermal conductivity were approximately twice the values obtained by using the second approximation and were approximately equal to the values obtained by using the fourth approximation. Therefore, with the exception of the translational thermal conductivity, the transport properties presented herein should be within 15 percent of the higher approximation values for the collision cross sections used.

With regard to assumption (4) the expression of Butler and Brokaw for the reaction contribution to the thermal conductivity was derived for dissociating reactions by neglecting thermal diffusion and assuming that the first approximation to the diffusion coefficients was valid. Ahtye (ref. 3) and DeVoto (ref. 4) state that for an ionizing gas, thermal diffusion may be important and should be considered. In addition, Ahtye states that the charge separation field  $\vec{E}_s$  caused by the difference in the ion and electron concentration gradients should be considered. Meador and Staton (ref. 7) rederived the heat-conductivity equation to include the effects of the charge separation field  $\vec{E}_s$  and the thermal diffusion on the reaction contribution to the total heat conductivity. The conclusion reached by Meador and Staton (ref. 7) was that Butler and Brokaw's expression is valid for ionization including a charge separation field and thermal diffusion if the diffusion coefficients in their expression are identified as the multicomponent rather than the binary coefficients.

## TRANSPORT COEFFICIENTS

The basic theory of transport phenomena is given in the books of Chapman and Cowling (ref. 10) and Hirschfelder, Curtiss, and Bird (ref. 11). A brief review of the derivation of the transport coefficients is given in references 3 and 4. Only the defining equation for the coefficients will be given here. The notation used is that of DeVoto (ref. 4) and Chapter VII of Hirschfelder, et al. (ref. 11).

The multicomponent diffusion coefficients  $D_{ij}$  and the thermal diffusion coefficients  $D_i^T$  are defined from the general expression for the diffusion velocity of the  $i^{\text{th}}$  species relative to the mass average velocity

$$\langle \vec{V}_i \rangle = \frac{n^2}{n_i \rho} \sum_{\substack{j=1 \\ j \neq i}}^v m_j D_{ij} \vec{d}_j - \frac{1}{n_i m_i} D_i^T \frac{\partial \ln T}{\partial \vec{r}} \quad (1)$$

where  $\vec{d}_j$  is a sum of terms proportional to the concentration gradient, the pressure gradient, and the difference in the external forces  $\vec{X}$  acting on the various species of molecules,

$$\vec{d}_j = \frac{\partial}{\partial \vec{r}} \left( \frac{n_j}{n} \right) + \left( \frac{n_j}{n} - \frac{n_j m_j}{\rho} \right) \frac{\partial \ln p}{\partial \vec{r}} - \left( \frac{n_j m_j}{p \rho} \right) \left( \frac{\rho}{m_j} \vec{X}_j - \sum_{l=1}^v n_l \vec{X}_l \right) \quad (2)$$

and  $v$  is the total number of different species contained in the gas. When  $v$  is 2,  $D_{ij}$  is the binary diffusion coefficient.

When the energy flux for a monatomic, reacting gas with no internal energy is written in the form (ref. 7)

$$q = -\lambda \frac{\partial T}{\partial \vec{r}} \quad (3)$$

The coefficient  $\lambda$  is defined as the thermal conductivity coefficient. References 4 and 7 show that  $\lambda$  is composed of three terms:

$$\lambda = \lambda_t + \lambda_r + \lambda_d$$

where  $\lambda_t$  is the translational contribution,  $\lambda_r$  is the reaction contribution, and, from reference 7,

$$\lambda_d = \left[ \frac{x_H}{(x_e + x_H)} \right] \left( \frac{k T D_{H-H^+} D_e^T}{m D_{e-H^+}} \right) \left( \frac{\partial \ln k_p}{\partial T} \right) \quad (4)$$

The viscosity coefficient  $\eta$  is defined by the relation

$$\tilde{P} = p \tilde{U} - 2\eta \tilde{S} \quad (5)$$

where  $\tilde{P}$  is the pressure tensor and  $\tilde{S}$  is the rate of shear tensor.

The total current  $\vec{J}$  is written in the form



$$\vec{J} = \sigma \vec{E} + \alpha \frac{\partial T}{\partial \vec{r}} \quad (6)$$

where  $\vec{E}$  is the electric field and  $\sigma$  is defined as the electrical conductivity.

Explicit expressions for the first or second approximations to the preceding transport coefficients are given in appendix B.

### COLLISION INTEGRAL

The equations for the transport properties in appendix B contain the average collision cross section  $\bar{\Omega}_{ij}^{(l,s)}$ , which is defined by the equation

$$\bar{\Omega}_{ij}^{(l,s)} = \frac{\Omega_{ij}^{(l,s)} \sqrt{\frac{2\pi\mu_{ij}}{kT}}}{\frac{1}{2} (s+1)! \left[ 1 - \frac{1}{2} \frac{1 + (-1)^l}{1+l} \right] \pi} \quad (7)$$

where  $\Omega_{ij}^{(l,s)}$  is the collision integral

$$\Omega_{ij}^{(l,s)} = \sqrt{\frac{kT}{2\pi\mu_{ij}}} \int_0^\infty e^{-r_{ij}^2} r_{ij}^{(2s+3)} Q_{ij}^{(l)} dr_{ij} \quad (8)$$

$Q_{ij}^{(l)}$  is the monoenergetic collision cross section

$$Q_{ij}^{(l)} = 2\pi \int_0^\infty (1 - \cos^l \chi) b db \quad (9)$$

$r_{ij}$  is the reduced relative velocity ( $\sqrt{\mu_{ij}/2kT}$ ) and  $\chi$  is the angle of deflection between the relative velocity vectors of the two colliding particles before and after the collision. The scattering angle  $\chi$  is a function of the interaction potential  $\phi$  (see eq. 8.2-1 of ref. 11). The collision integrals for each interaction will be considered separately in the following paragraphs.

### Hydrogen Atom - Hydrogen Atom Collisions

When two hydrogen atoms in their ground states collide, the interaction can occur along either of two potentials. Out of every four H-H collisions, there is a possibility that one will follow a  $^1\Sigma$  energy curve corresponding to the normal hydrogen molecule and that three will follow the  $^3\Sigma$  energy curve

corresponding to the lowest repulsive state of hydrogen. For the potential energy of interaction corresponding to the  $^3\Sigma$  energy curve, an exponential-repulsive potential was used in the calculations, and for the potential energy related to the  $^1\Sigma$  energy curve, an exponential-attractive potential was used. For both these exponential potentials, the equation was of the form

$$\varphi(r) = Ae^{-r/\rho} \quad (10)$$

where  $r$  is the distance of separation of the two colliding particles and  $A$  and  $\rho$  are suitable parameters peculiar to the interaction. The constant  $A$  is positive for repulsion and negative for attraction. For the  $^3\Sigma$  interaction, the parameters  $A$  and  $\rho$  were taken from reference 12. For the  $^1\Sigma$  interaction, the data of reference 13 were empirically fitted to the exponential potential for  $\varphi(r)$  between  $10^{-4}$  and 1 electron volt by using the method of least squares. The results are

$$\text{H-H } ^1\Sigma: \varphi(r) = -80 e^{-\frac{r}{0.3922}}, \text{ eV}$$

$$\text{H-H } ^3\Sigma: \varphi(r) = 60.4 e^{-\frac{r}{0.3319}}, \text{ eV}$$

where  $r$  is in angstroms. With the parameters  $A$  and  $\rho$ , the quantities  $\bar{\Omega}^{(l,s)}: ^3\Sigma \text{ H-H}$  and  $\bar{\Omega}^{(l,s)}: ^1\Sigma \text{ H-H}$  were obtained by using the tabulations in references 14 and 15, respectively. In the equations for the transport properties, the  $\bar{\Omega}^{(l,s)}$  used was weighted with its multiplicity, therefore

$$\bar{\Omega}_{\text{H-H}}^{(l,s)} = \frac{1}{4} \bar{\Omega}_{\text{H-H}: ^1\Sigma}^{(l,s)} + \frac{3}{4} \bar{\Omega}_{\text{H-H}: ^3\Sigma}^{(l,s)}$$

#### Hydrogen Atom - Hydrogen Ion Collisions

For these collisions, it is necessary to consider the effects of resonant charge exchange on the collision integrals. In reference 16 these effects are discussed and it is shown that, only for odd values of  $l$ , are the collision integrals  $\Omega^{(l,s)}$  affected by charge exchange and independent of the  $s$  values. Therefore, the collision integrals  $\Omega^{(2,s)}$  are independent of charge exchange. In the first and second approximations, the only odd value of  $l$  that appears in the transport properties equations is  $l$  equals 1. Reference 16 shows that at high temperatures, the collision integrals  $\Omega^{(1,s)}$  are given to a high degree of accuracy by

$$\Omega^{(1,s)} = 2\Omega_{\text{ex}}^{(1,s)} = \sqrt{\frac{2kT}{\pi\mu}} \int_0^\infty e^{-r^2} r^{(2s+3)} Q_{\text{ex}}^{(1)} dr \quad (11)$$

where  $\Omega^{(l,s)}$  is the charge exchange collision integral and  $Q_{ex}^{(1)}$  is the monoenergetic collision cross section for charge exchange.

The monoenergetic collision cross section was calculated by using the expressions given in reference 17. The results for  $Q_{ex}^{(1)}$  in angstroms<sup>2</sup> were then fitted to the expression

$$Q_{ex}^{(1)} = (B - C \ln E)^2, \text{ \AA}^2 \quad (12)$$

where  $B = 5.44$ ,  $C = 0.442$ , and  $E$  is the relative energy in ergs before the collision. Equation (12) was then substituted in equation (11) and the resulting expression was integrated to obtain  $\Omega_{ex}^{(1,s)}$ . The result is given in appendix C.

The collision integrals  $\Omega^{(2,2)}$  are obtained from the following considerations. The interaction can occur along either of two potential energy curves, the  $2p\sigma(^2\Sigma_u^+)$  or the  $1s\sigma(^2\Sigma_g^+)$  (ref. 18). The  $2p\sigma(^2\Sigma_u^+)$  corresponds to a repulsive potential at all separations. The  $1s\sigma(^2\Sigma_g^+)$  corresponds to an attractive potential at large separations and to a repulsive potential at small separations (see ref. 18 for a discussion). For the  $1s\sigma(^2\Sigma_g^+)$  potential energy, it was found that the collision cross sections obtained for temperatures less than 15 000° K by using an exponential-attractive potential (a strictly attractive potential) were within 10 percent of those calculated by using a Morse potential (a potential that is attractive at large separations and repulsive at small separations). For higher temperatures they were always within a factor of 2 of the values obtained by using a Morse potential. Since for temperatures greater than 15 000° K, the concentration of neutral hydrogen atoms is negligible, only a small error will be introduced by using an exponential-attractive potential over the entire temperature range. Therefore, in the calculation of the collision integrals  $\Omega_{H-H^+}^{(2,2)}$ , the  $1s\sigma(^2\Sigma_g^+)$  potential was fitted with an exponential-attractive potential for values of separation distances from approximately 1 to 8 angstroms, and the  $2p\sigma(^2\Sigma_u^+)$  was fitted with an exponential-repulsive potential over the same separation distances. The results are

$$\begin{aligned} \phi(r) &= 9.5628 e^{-\frac{r}{1.022}}, \text{ eV} && \text{for } 1s\sigma(^2\Sigma_g^+) \\ \phi(r) &= -56.37 e^{-\frac{r}{0.5817}}, \text{ eV} && \text{for } 2p\sigma(^2\Sigma_u^+) \end{aligned}$$

The data for both potentials were taken from references 19 and 20.

## Hydrogen Atom - Electron Collisions

The zeroth order singlet and triplet elastic phase shifts for monoenergetic e-H scattering processes are tabulated in reference 21. The singlet phase shift is used when the total spin of the incident and the atomic electron is zero, and the triplet phase shift is appropriate when the total spin of the incident and the atomic electron is 1. The monoenergetic collision cross section (eq. (9)) is given in terms of the zeroth order phase shift by the equation (see ref. 22)

$$Q^{(1)} = \frac{4\pi\hbar^2}{m^2g^2} \sin^2\delta_0$$

$$Q^{(2)} = \frac{8\pi\hbar^2}{3m^2g^2} \sin^2\delta_0$$

where  $\hbar$  is Planck's constant divided by  $2\pi$ , and  $\delta_0$  is the zeroth order phase shift. In the equations for the transport properties, the collision cross sections for singlet  $\delta_0^-$  and the triplet  $\delta_0^+$  phase shifts were weighted with their respective multiplicities. The multiplicity is equal to  $2S + 1$  where  $S = 0, 1$  for the singlet and triplet phase shifts, respectively. Therefore

$$\left. \begin{aligned} Q_{av}^{(1)} &= \frac{4\pi\hbar^2}{m^2g^2} \left( \frac{1}{4} \sin^2\delta_0^- + \frac{3}{4} \sin^2\delta_0^+ \right) \\ Q_{av}^{(2)} &= \frac{8\pi\hbar^2}{3m^2g^2} \left( \frac{1}{4} \sin^2\delta_0^- + \frac{3}{4} \sin^2\delta_0^+ \right) \end{aligned} \right\} \quad (13)$$

In order to perform the integration of equation (8) when equation (13) is substituted,  $\sin^2\delta_0^- + 3 \sin^2\delta_0^+$  was fitted with a fourth-degree polynomial in the velocity range from approximately  $3 \times 10^7$  to  $1.3 \times 10^8$  centimeters per second (temperature from approximately  $2000^\circ$  to  $40\,000^\circ$  K). The resulting polynomial was substituted in equation (8) and the integration performed to obtain  $\Omega_{H-e}^{(l,s)}$ . The results are given in appendix C.

## Hydrogen Ion - Hydrogen Ion, Hydrogen Ion - Electron, and Electron-Electron Collisions

The shielded coulomb potential as given in reference 23 was used for these interactions. The shielded coulomb potential is of the form

$$\phi = \frac{q}{r} e^{-r/h}$$

where  $h$  is the Debye length and  $q$  is the charge.

## CALCULATIONS

The viscosity, thermal conductivity, electrical conductivity, binary and multicomponent diffusion coefficients, and thermal diffusion coefficients were calculated for equilibrium atomic hydrogen at temperatures ranging from 5000° to 40 500° K and pressures from  $10^{-5}$  to  $10^2$  atmospheres. The degree of ionization needed for calculating the mole fractions was obtained from

$$\beta = \sqrt{\frac{K_i}{p + K_i}}$$

where  $K_i$ , the ionization equilibrium constant, was taken from reference 9.

The equations used for calculating the transport properties are given in appendix B. The calculations were performed on an IBM 7094 computing machine.

## RESULTS AND DISCUSSION

Listed in table I are the collision cross sections and the quantities  $A^*$ ,  $B^*$ , and  $C^*$  that depend on temperature only. Table II and figures 3 to 10 present the transport properties for pressures from  $10^{-5}$  to  $10^2$  atmospheres in 500° K temperature intervals from 5000° to 40 500° K. Also in table II, the shielded coulombic collision cross sections  $\bar{\sigma}_c^{(l,s)}$  and the quantities  $A^*$ ,  $B^*$ , and  $C^*$  for the shielded coulombic potential are presented. These quantities depend on temperature and pressure since they are a function of the Debye shielding length, which is a function of the charged particle density.

Figure 3 shows the product of the pressure and binary diffusion coefficient as a function of temperature and pressure. From figures 3(a) and (c), this product for the atom-ion and the atom-electron becomes more independent of pressure as the temperature increases.

Figure 4 illustrates the variation of the product of the pressure and multicomponent diffusion coefficients with temperature and pressure. A comparison of the product  $pD_{H+-H}$  (fig. 4(e)) with the product  $pD_{H-H+}$  (fig. 4(f)) reveals that these two coefficients are approximately equal for all pressures. Also from figures 4(e) and (f), the products  $pD_{H+-H}$  and  $pD_{H-H+}$  are independent of pressure.

Figure 5 shows the thermal diffusion coefficient as a function of temperature and pressure. Figure 5(a) shows that the atomic hydrogen coefficient  $D_{H-H}^T$  is negative for all temperatures shown. (Negative values indicate that the particle tends to move toward the warmer region.) Therefore, in a physical system, the diffusion of hydrogen atoms caused by a temperature gradient is in the same direction as the diffusion of the hydrogen atoms caused by a concentration gradient. This is just the opposite of atomic hydrogen thermal diffusion at the low temperatures, where ionization was not important (ref. 1).

Figures 5(b) and (c) show that the electron thermal diffusion coefficient is positive for all temperatures and pressures studied and that the hydrogen

ion thermal diffusion coefficient is positive at the lower temperatures and becomes negative at the higher temperatures. Hence, the electron thermal diffusion is in the same direction as the concentration diffusion, and the hydrogen ion thermal diffusion is in the same direction as the concentration diffusion at the lower temperatures and opposite at the higher temperatures.

The condition that

$$\sum_i n_i m_i \langle \vec{V}_i \rangle = 0$$

implies from equation (1) that

$$D_H^T + D_{H^+}^T + D_e^T = 0$$

which is substantiated in table II and figure 5.

A comparison of the values of the thermal diffusion coefficients reveals that, up to a high degree of ionization (mole fraction of ions,  $x_{H^+} \lesssim 0.40$ ),  $D_H^T$  is approximately equal to  $-D_{H^+}^T$ . Therefore, the diffusive motion of the ions and atoms is almost independent of the diffusive motion of the electron. This is a result of the small mass of the electron in comparison with the mass of the ion and atom.

Figures 6 and 7 show the variation of the viscosity coefficient and the translational thermal conductivity, respectively, with temperature for pressures from  $10^{-5}$  to  $10^2$  atmospheres. From these figures it is seen that, except for conductivity corresponding to a pressure of  $10^2$  atmospheres, these two quantities first decrease to a minimum and then increase monotonically with temperature. The reason for the variation may be explained as follows: These quantities vary inversely with the collision cross sections. As the temperature increases, there is a transition from a gas composed of all neutral species to a gas composed of all charged species. Correspondingly, the collision cross sections of the gas change from the relatively small values corresponding to neutral particle collisions to the relatively large values corresponding to charged particle collisions. For pressures less than  $10^2$  atmospheres, the transition occurs rapidly enough to cause both the viscosity and frozen thermal conductivity to decrease as the temperature increases even though the neutral and the coulombic collision cross sections decreased with increasing temperature.

Figure 8 shows the variation of  $\lambda_d$  with temperature and pressures. It is seen that this quantity is always less than 6 percent of the total thermal conductivity.

Figure 9 shows the variation of the total thermal conductivity with temperature for the same pressures. Ionization causes the total thermal conductivity to rise sharply with temperature and to have very pronounced peaks. The peaks occur where the quantity  $T(\partial K_1/\partial T)$  reaches a maximum and tend to broaden as the pressure increases. The electrical conductivity is shown as a function of temperature and pressure in figure 10.

## Comparison With Previous Results

Yos (ref. 5) calculated the thermal conductivity, viscosity coefficient, the electrical conductivity of equilibrium hydrogen, and the  $H-e^-$  and  $H-H^+$  binary diffusion coefficient for pressures of 1, 3, 10, and 30 atmospheres for temperatures up to  $30\,000^\circ K$ . These calculations are the only other calculations of the transport properties of partially ionized hydrogen known to the author.

Figure 11 shows a comparison of the present results for the electrical conductivity with those of reference 5 for a pressure of 1 atmosphere. Also shown at a temperature of  $30\,000^\circ K$  is the value obtained by using the Spitzer equation (ref. 24) for the electrical conductivity of a completely ionized gas. At a temperature of  $30\,000^\circ K$ , the present results are larger than those obtained from the Spitzer equation by approximately 10 percent and larger than those of Yos by approximately 17 percent. The agreement with the present results is reasonable considering the difference in the method of obtaining them.

In reference 5, the first approximation equation (eq. (B18)) was used to calculate the electrical conductivity, and the coulombic collision cross sections were adjusted so that the results agreed as closely as possible with the results obtained by using the Spitzer equation when the gas was completely ionized. As shown in figure 12, these coulombic collision cross sections are lower than the shielded coulombic collision cross sections used in this report. Since the electrical conductivity varies inversely with the collision cross section, the lower values of electrical conductivity obtained in reference 5 can only be attributed to his use of only the first approximation equation.

In figures 13 and 14 are presented comparisons of the values for the translational thermal conductivity and the viscosity, respectively. The present results agree approximately with the result of reference 5 for temperatures less than  $10\,000^\circ K$  but are lower for all higher temperatures. The differences are again attributable to the use in reference 5 of less rigorous equations and lower collision cross sections. From the equations in appendix B, the viscosity and translational thermal conductivity vary inversely with the collision cross sections, which are in the correct direction to account partly for the observed difference.

A comparison of the atom-electron and the atom-ion binary diffusion coefficients of the present calculations with the values presented in reference 5 is given in figure 15. The larger values obtained for the present calculations are primarily a result of the use of the second approximation (rather than the first) approximation.

Lewis Research Center,  
National Aeronautics and Space Administration,  
Cleveland, Ohio, October 6, 1965.

# APPENDIX A

## SYMBOLS

$A$	constant in exponential potential energy ( $\phi = Ae^{-r/\rho}$ ), eV
$A^*, B^*, C^*$	ratio of collision integrals that appear in expression for transport properties of mixtures (eqs. (B3), (B7), and (B8))
$b$	impact parameter, cm
$D_{ij},$ $D(i-j),$ or $D_M$	multicomponent diffusion coefficient of $i^{\text{th}}$ through $j^{\text{th}}$ species, $\text{cm}^2/\text{sec}$
$D_i^T$	thermal diffusion coefficient of $i^{\text{th}}$ species, $\text{g}/(\text{cm})(\text{sec})$
$\mathcal{D}_{ij}$	binary diffusion coefficient between $i^{\text{th}}$ and $j^{\text{th}}$ species, $\text{cm}^2/\text{sec}$
$\vec{d}_j$	defined by eq. (2)
$E$	relative energy, ergs
$\vec{E}$	electric field
$\vec{E}_s$	charge separation field
$e$	charge of electron, statcoulombs
$g$	initial relative velocity of colliding particles, $\text{cm}/\text{sec}$
$\Delta H$	heat of reaction, $\text{cal}/\text{mole}$
$h$	Debye distance, cm
$\hbar$	Planck's constant divided by $2\pi$ , $(\text{erg})(\text{sec})$
$\vec{J}$	total current
$K_i$	ionization equilibrium constant, atm
$k$	Boltzmann constant
$M_i$	molecular weight of $i^{\text{th}}$ species, $\text{g}/\text{mole}$
$m_i$	mass of $i^{\text{th}}$ particle, g



$m$	mass of electron, g
$n$	total number of particle per unit volume, $\text{cm}^{-3}$
$n_i$	number of $i^{\text{th}}$ particles per unit volume, $\text{cm}^{-3}$
$\tilde{P}$	pressure tensor
$p$	pressure, atm
$Q_{\text{ex}}$	monoenergetic collision cross section for charge exchange, $\text{\AA}^2$
$Q_{ij}^{(l)}$	monoenergetic collision cross section, $\text{\AA}^2$
$q$	charge of ion, statcoulombs
$\vec{q}$	total energy flux per unit area, $\text{cal}/(\text{cm}^2)(\text{sec})$
$R$	universal gas constant
$r$	separation distance between colliding particles, $\text{\AA}$
$\frac{\partial}{\partial r}$	symbol for the gradient operator $\nabla$ , $\text{cm}^{-1}$
$\tilde{S}$	rate of shear tensor
$T$	temperature, $^{\circ}\text{K}$
$\tilde{U}$	unit tensor
$\langle V_i \rangle$	diffusion velocity of $i^{\text{th}}$ species, $\text{cm}/\text{sec}$
$\vec{X}_i$	external force acting on $i^{\text{th}}$ species
$x_i$	mole fraction of $i^{\text{th}}$ species
$Z$	compressibility factor, $pV/RT$ , where $V$ is volume
$\alpha$	coefficient of temperature gradient term in current equation (eq. (6))
$\beta$	degree of ionization
$r_{ij}$	reduced initial velocity between $i^{\text{th}}$ and $j^{\text{th}}$ colliding particles, $\left( \sqrt{\mu_{ij}/2kT} \right) g$
$\Delta_c$	$\frac{1}{1 - \Delta_c}$ is second-approximation correction term for electrical conductivity

$\Delta_{ij}$	$\frac{1}{1 - \Delta_{ij}}$ is second approximation correction term for binary diffusion coefficient
$\delta_0$	zeroth order phase shift angle
$\delta_0^+$	triplet zeroth order phase shift angle
$\delta_0^-$	singlet zeroth order phase shift angle
$\eta$	viscosity coefficient, g/(cm)(sec)
$\lambda$	total thermal conductivity of gas mixture, cal/(cm)(sec)(°K)
$\lambda_d$	defined by eq. (4)
$\lambda_r$	reaction contribution to thermal conductivity, cal/(cm)(sec)(°K)
$\lambda_t$	translational contribution to thermal conductivity, cal/(cm)(sec)(°K)
$\mu_{ij}$	reduced mass of i-j species
$\nu$	total number of different species contained in gas
$\rho$	density, g/cm <sup>3</sup>
$\sigma$	electrical conductivity, mhos/m
$\phi(r)$	interaction potential energy, eV
$\chi$	angle of deflection between relative velocity vectors of two colliding particles before and after collision
$\Omega_{ij}^{(l,s)}$	collision integral between i <sup>th</sup> and j <sup>th</sup> particles (l,s are dummy indices), cm <sup>3</sup> /sec
$\bar{\Omega}_{ij}^{(l,s)}$	average collision cross section for i <sup>th</sup> and j <sup>th</sup> particles (l,s are dummy indices), Å <sup>2</sup>

Subscripts:

c	coulombic interactions
e	electron
ex	collisions where charge exchange occurs
H	neutral atomic hydrogen
H <sup>+</sup>	atomic hydrogen ion (proton)

## APPENDIX B

### EQUATIONS FOR TRANSPORT COEFFICIENT

In the following equations the subscripts 1, 2, and 3 denote the neutral hydrogen atom, the atomic hydrogen ion, and electrons, respectively:

$$\begin{aligned} \eta_{ij} &= \eta_{ji} & A_{ij}^* &= A_{ji}^* & B_{ij}^* &= B_{ji}^* \\ C_{ij}^* &= C_{ji}^* & \mathcal{Q}_{ij} &= \mathcal{Q}_{ji} & \lambda_{ij} &= \lambda_{ji} \end{aligned}$$

### Viscosity

The equations for the first approximation to the viscosity is (ref. 11, eq. (8) 2-28)

$$\eta = \sum_{i=1}^3 \frac{x_i^2}{H_{ii}} - \sum_{i=1}^3 \sum_{\substack{j=1 \\ j \neq i}}^3 \frac{x_i x_j H_{ij}}{H_{ii} H_{jj}} + \sum_{i=1}^3 \sum_{\substack{j=1 \\ j \neq i}}^3 \sum_{\substack{k=1 \\ k \neq i}}^3 \frac{x_j x_k H_{ij} H_{ik}}{H_{ii} H_{jj} H_{kk}} \quad (B1)$$

where

$$H_{11} = \frac{x_1^2}{\eta_1} + \frac{2x_1 x_2}{\eta_{12}} \frac{M_1 M_2}{(M_1 + M_2)^2} \left( \frac{5}{3A_{12}^*} + \frac{M_2}{M_1} \right) + \frac{2x_1 x_3}{\eta_{13}} \frac{M_1 M_3}{(M_1 + M_3)^2} \left( \frac{5}{3A_{13}^*} + \frac{M_3}{M_1} \right)$$

$$H_{22} = \frac{x_2^2}{\eta_2} + \frac{2x_2 x_1}{\eta_{21}} \frac{M_2 M_1}{(M_1 + M_2)^2} \left( \frac{5}{3A_{21}^*} + \frac{M_1}{M_2} \right) + \frac{2x_2 x_3}{\eta_{23}} \frac{M_3 M_2}{(M_2 + M_3)^2} \left( \frac{5}{3A_{23}^*} + \frac{M_3}{M_2} \right)$$

$$H_{33} = \frac{x_3^2}{\eta_3} + \frac{2x_3 x_1}{\eta_{31}} \frac{M_3 M_1}{(M_3 + M_1)^2} \left( \frac{5}{3A_{31}^*} + \frac{M_1}{M_3} \right) + \frac{2x_3 x_2}{\eta_{32}} \frac{M_3 M_2}{(M_3 + M_2)^2} \left( \frac{5}{3A_{32}^*} + \frac{M_2}{M_3} \right)$$

$$H_{12} = H_{21} = - \frac{2x_1 x_2}{\eta_{12}} \frac{M_1 M_2}{(M_1 + M_2)^2} \left( \frac{5}{3A_{12}^*} - 1 \right)$$

$$H_{13} = H_{31} = - \frac{2x_1 x_3}{\eta_{13}} \frac{M_1 M_3}{(M_1 + M_3)^2} \left( \frac{5}{3A_{13}^*} - 1 \right)$$

$$H_{23} = H_{32} = - \frac{2x_2 x_3}{\eta_{23}} \frac{M_2 M_3}{(M_2 + M_3)^2} \left( \frac{5}{3A_{23}^*} - 1 \right)$$

The molecular weight of the hydrogen ion is approximately equal to the molecular weight of the hydrogen atom, therefore  $M_2 \approx M_1$ . Also the mass of the electron is much less than the mass of the ion and atom ( $M_3/M_2 \approx M_3/M_1 \ll 1$ ). With these approximations, equation (B1) becomes

$$\eta_{\text{mix}} = \frac{x_1^2}{H_{11}} + \frac{x_2^2}{H_{22}} + \frac{x_3^2}{H_{33}} - \frac{2x_2x_1H_{12}}{H_{11}H_{22}} + \frac{x_2^2H_{12}^2}{H_{11}H_{22}^2} + \frac{x_1^2H_{12}^2}{H_{11}^2H_{22}} \quad (\text{B2})$$

where

$$H_{11} = \frac{x_1^2}{\eta_1} + \frac{x_1x_2}{2\eta_{12}} \left( \frac{5}{3A_{12}^*} + 1 \right)$$

$$H_{22} = \frac{x_2^2}{\eta_2} + \frac{x_1x_2}{2\eta_{21}} \left( \frac{5}{3A_{21}^*} + 1 \right)$$

$$H_{33} = \frac{x_3^2}{\eta_3} + \frac{2x_3x_1}{\eta_{31}} + \frac{2x_3x_2}{\eta_{32}}$$

$$H_{12} = \frac{-x_1x_2}{2\eta_{12}} \left( \frac{5}{3A_{12}^*} - 1 \right)$$

$$H_{13} \approx 0$$

$$H_{23} \approx 0$$

$$A_{ij}^* = \frac{\bar{\Omega}_{ij}(2,2)}{\bar{\Omega}_{ij}(1,1)} \quad i = 1, 2, 3, \text{ and } j = 1, 2, 3 \quad (\text{B3})$$

$$\eta_i = 266.93 \times 10^{-7} \frac{\sqrt{M_i T}}{\bar{\Omega}_{ii}(2,2)} \quad (\text{B4})$$

$$\eta_{ij} = 266.93 \times 10^{-7} \frac{\sqrt{\frac{2M_i M_j T}{M_i + M_j}}}{\bar{\Omega}_{ij}(2,2)} \quad (\text{B5})$$

# Binary Diffusion Coefficients

The second approximation to the binary diffusion coefficient is (ref. 11, eq. (8.2-47) and (8.A-4)).

$$D_{ij} = 0.002628 \frac{\sqrt{\frac{T^3(M_i + M_j)}{2M_i M_j}}}{p\bar{\Omega}_{ij}^{(1,1)}} \left( \frac{1}{1 - \Delta_{ij}} \right) \quad (B6)$$

$$\Delta_{ij} = \frac{(6C_{ij}^* - 5)^2}{60(X_\lambda - Y_\lambda)} W$$

$$W = \frac{x_i^2}{\lambda_i} \left( \frac{M_i}{M_j} \right) + \frac{2x_i x_j}{\lambda_{ij}} \left[ 1 + \frac{15}{8A_{ij}^*} \frac{(M_i - M_j)^2}{M_i M_j} \right] + \frac{x_j^2}{\lambda_j} \left( \frac{M_j}{M_i} \right)$$

$$X_\lambda = \frac{x_i^2}{\lambda_i} + \frac{2x_i x_j}{\lambda_{ij}} + \frac{x_j^2}{\lambda_j}$$

$$Y_\lambda = \frac{x_i^2}{\lambda_i} U^{(1)} + \frac{2x_i x_j}{\lambda_{ij}} U^{(Y)} + \frac{x_j^2}{\lambda_j} U^{(2)}$$

$$U^{(1)} = \frac{4}{15} A_{ij}^* - \frac{1}{12} \left( \frac{12}{5} B_{ij}^* + 1 \right) \frac{M_i}{M_j} + \frac{1}{2} \frac{(M_i - M_j)^2}{M_i M_j}$$

$$U^{(Y)} = \frac{4}{15} A_{ij}^* \left[ \frac{(M_i + M_j)^2}{4M_i M_j} \right] \frac{\lambda_{ij}^2}{\lambda_i \lambda_j} - \frac{1}{12} \left( \frac{12}{5} B_{ij}^* + 1 \right) - \frac{5}{32A_{ij}^*} \left( \frac{12}{5} B_{ij}^* - 5 \right) \frac{(M_i - M_j)^2}{M_i M_j}$$

$$U^{(2)} = \frac{4}{15} A_{ij}^* - \frac{1}{12} \left( \frac{12}{5} B_{ij}^* + 1 \right) \frac{M_j}{M_i} + \frac{1}{2} \frac{(M_i - M_j)^2}{2M_i M_j}$$

$$B_{ij}^* \equiv \frac{5\bar{\Omega}_{ij}^{(1,2)} - 4\bar{\Omega}_{ij}^{(1,3)}}{\bar{\Omega}_{ij}^{(1,1)}} \quad (B7)$$

$$C_{ij}^* \equiv \frac{\bar{\Omega}_{ij}^{(1,2)}}{\bar{\Omega}_{ij}^{(1,1)}} \quad (B8)$$

$A_{ij}^*$  is given by equation (B3) and the pure gas thermal conductivities are

$$\lambda_1 = 1989.1 \times 10^{-7} \frac{\sqrt{\frac{T}{M_1}}}{\bar{\Omega}_{11}(2,2)} \quad (B9)$$

$$\lambda_{ij} = 1989.1 \times 10^{-7} \frac{\sqrt{\frac{T(M_1 + M_j)}{2M_1 M_j}}}{\bar{\Omega}_{ij}(2,2)} \quad (B10)$$

### Thermal Conductivity

The total thermal conductivity  $\lambda$  may be written as the sum of three terms

$$\lambda = \lambda_t + \lambda_d + \lambda_r \quad (B11)$$

where  $\lambda_t$  is the translational contribution,  $\lambda_d$  is the diffusional contribution, and  $\lambda_r$  is the reaction contribution including thermal diffusion and the charge separation field.

The second-approximation equation for the sum of the translational and diffusional contributions is (ref. 25)

$$\lambda_t = 4 \frac{\begin{vmatrix} L_{11} & L_{12} & L_{13} & x_1 \\ L_{21} & L_{22} & L_{23} & x_2 \\ L_{31} & L_{32} & L_{33} & x_3 \\ x_1 & x_2 & x_3 & 0 \end{vmatrix}}{\begin{vmatrix} L_{11} & L_{12} & L_{13} \\ L_{21} & L_{22} & L_{23} \\ L_{31} & L_{32} & L_{33} \end{vmatrix}} \quad (B12)$$

where

$$L_{ii} = -\frac{4x_i^2}{\lambda_i} - \frac{16T}{25p} \sum_{\substack{k=1 \\ k \neq i}}^3 \frac{x_i x_k \left( \frac{15}{2} M_i^2 + \frac{25}{4} M_k^2 - 3M_{ik}^2 B_{ik}^* + 4M_i M_k A_{ik}^* \right)}{(M_i + M_k)^2 \bar{\Omega}_{ik}} \quad (B13)$$

$$L_{ij}(i \neq j) = \frac{16T}{25p} \frac{x_i x_j M_i M_j \left( \frac{55}{4} - 3B_{ij}^* - 4A_{ij}^* \right)}{(M_i + M_j)^2 \mathcal{D}_{ij}} \quad (B14)$$

$\mathcal{D}_{ij}$  are the binary diffusion coefficients given in equation (B6) and  $A_{ij}^*$  and  $B_{ij}^*$  are given by equations (B3) and (B7), respectively.

The equation for  $\lambda_d$  is given by equation (4) from reference 7

$$\lambda_d = \left[ \frac{x_1 k T D_{12} D_3^T}{(x_3 + x_1) m D_{32}} \right] \left( \frac{\partial \ln K_i}{\partial T} \right) \quad (B15)$$

where  $K_i$  is the ionization equilibrium constant,  $k$  is the Boltzmann constant,  $m$  is the electron mass,  $D_3^T$  is the electron thermal diffusion coefficient, and  $D_{12}$  and  $D_{32}$  are the atom-ion and the electron-ion multicomponent diffusion coefficients.

The equation for the reaction contribution to the total thermal conductivity is (refs. 6 and 7)

$$\lambda_r = \frac{p \frac{(\Delta H)^2}{RT^2}}{RT \left[ \frac{(x_2 + x_1)^2}{x_1 x_2 D_{12}} + \frac{(x_3 + x_1)^2}{x_3 x_1 D_{13}} \right]} \quad (B16)$$

Since  $x_2 = x_3$

$$\lambda_r = \left( \frac{\Delta H}{RT} \right)^2 \frac{p x_1 x_2}{(x_1 + x_2)^2 T \left( \frac{1}{D_{12}} + \frac{1}{D_{13}} \right)} \quad (B17)$$

where  $D_{12}$  and  $D_{13}$  are the atom-ion and atom-electron multicomponent diffusion coefficients, respectively.

#### Multicomponent and Thermal Diffusion Coefficients

The second-approximation equation for the multicomponent  $D_{hk}$  and thermal diffusion coefficients  $D_k^T$  are, respectively, (ref. 4)

$$D_{nk} = \frac{3\phi n_h}{2nm_k} \sqrt{\frac{2\pi kT}{m_h}} \left| \frac{1}{|q|} \begin{array}{ccc} q_{1j}^{00} & q_{1j}^{01} & (\delta_{1k} - \delta_{1k}) \\ q_{1j}^{10} & q_{1j}^{11} & 0 \\ \delta_{jh} & 0 & 0 \end{array} \right| \quad (B18)$$

and

$$D_k^T = \frac{15}{4} \frac{\sqrt{2\pi m_k kT}}{|q|} \left| \begin{array}{ccc} q_{1j}^{00} & q_{1j}^{01} & 0 \\ q_{1j}^{10} & q_{1j}^{11} & n_1 \\ \delta_{kj}n_j & 0 & 0 \end{array} \right| \quad (B19)$$

where  $|q|$  is the determinant formed from the numerator by deleting the last row and the last column. The symbols  $q_{1j}^{00}$ ,  $q_{1j}^{01}$ ,  $q_{1j}^{10}$ , and  $q_{1j}^{11}$  represent blocks of elements with both  $i$  and  $j$  ranging from 1 to 3. The expressions for the  $q_{1j}$ 's are as follows:

$$q_{1j}^{00} = 8 \sum_{l=1}^3 \frac{n_l m_l^{1/2}}{(m_1 + m_l)^{1/2}} \pi \bar{\Omega}_{il}^{(1,1)} \left[ n_i \sqrt{\frac{m_l}{m_j}} (\delta_{1j} - \delta_{jl}) - n_j \frac{\sqrt{m_l m_j}}{m_i} (1 - \delta_{il}) \right] \quad (B20)$$

$$q_{1j}^{01} = 8n_1 \left( \frac{m_1}{m_j} \right)^{3/2} \sum_{l=1}^3 \frac{n_l m_l^{3/2}}{(m_1 + m_l)^{3/2}} \pi \left[ \frac{5}{2} \bar{\Omega}_{il}^{(1,1)} - 3\bar{\Omega}_{il}^{(1,2)} \right] (\delta_{1j} - \delta_{jl}) \quad (B21)$$

$$q_{1j}^{10} = \left( \frac{m_j}{m_i} \right) q_{1j}^{01} \quad (B22)$$

$$q_{1j}^{11} = 8n_1 \left( \frac{m_1}{m_j} \right)^{3/2} \sum_{l=1}^3 \frac{\pi n_l m_l^{1/2}}{(m_1 + m_l)^{5/2}} \left\{ (\delta_{1j} - \delta_{jl}) \left[ \frac{5}{4} (6m_j^2 + 5m_l^2) \bar{\Omega}_{il}^{(1,1)} - 15m_l^2 \bar{\Omega}_{il}^{(1,2)} \right] \right. \\ \left. + 12m_l^2 \bar{\Omega}_{il}^{(1,3)} \right\} + (\delta_{1j} + \delta_{jl}) 4m_j m_l \bar{\Omega}_{il}^{(2,2)} \quad (B23)$$



where  $\delta_{ij}$  is the Kronecker delta; that is,

$$\begin{aligned}\delta_{ij} &= 1 & \text{if } j &= i \\ &= 0 & \text{if } j &\neq i\end{aligned}$$

### Electrical Conductivity

The equation for the second approximation for the electrical conductivity is (ref. 26)

$$\sigma = \frac{\sigma_0}{1 - \Delta_c} \quad (\text{B24})$$

where  $\sigma_0$  is the first approximation to the electrical conductivity and  $\Delta_c$  is the second approximation correction factor:

$$\sigma_0 = \frac{3x_3 e^2}{16} \sqrt{\frac{2}{\pi m_e kT}} \frac{1}{\left[ x_3 \bar{\Omega}_{23}^{(1,1)} + x_1 \bar{\Omega}_{13}^{(1,1)} \right]} \quad (\text{B25})$$

$$\Delta_c = \frac{5A_1^2}{2A_0 A_2}$$

$$A_0 = x_2^4 \sqrt{\pi} \bar{\Omega}_{23}^{(1,1)} + x_1^4 \sqrt{\pi} \bar{\Omega}_{13}^{(1,1)}$$

$$A_1 = x_2 Z_{23}^4 \sqrt{\pi} \bar{\Omega}_{23}^{(1,1)} + x_1 Z_{13}^4 \sqrt{\pi} \bar{\Omega}_{13}^{(1,1)}$$

$$A_2 = x_2 \left[ Y_{13}^4 \sqrt{\pi} \bar{\Omega}_{23}^{(1,1)} + 0.2 \sqrt{2} Z_{33}^{11} \sqrt{\pi} \bar{\Omega}_{33}^{(1,1)} \right] + x_1 Y_{13}^4 \sqrt{\pi} \bar{\Omega}_{13}^{(1,1)}$$

where  $e$  is the electronic charge

$$Z_{ij} = 1 - \frac{6}{5} C_{ij}^*$$

$$Z_{33}^{11} = 2A_{33}^*$$

$$Y_{ij} = 2.5 - \frac{6}{5} B_{ij}^*$$

and  $\bar{\Omega}_{ij}^{(1,1)}$  are the collision cross sections given in equation (7). Subscripts 1, 2, and 3 refer to neutral atom, ion, and electron, respectively. The value of  $\Delta_c$  is given in table II.

## APPENDIX C

### EXPRESSIONS FOR HYDROGEN ATOM - HYDROGEN ION AND HYDROGEN

#### ATOM - ELECTRON COLLISIONS INTEGRALS

##### Hydrogen Atom - Hydrogen Ion Collision Integral

As stated in the text, the collision integral  $\Omega^{(1,s)}$  is given approximately by

$$\begin{aligned}\Omega^{(1,s)} &= 2\Omega_{\text{ex}}^{(1,s)} \\ &= 2\sqrt{\frac{kT}{2\mu\pi}} \int_0^\infty e^{-r^2} r^{(2s+3)} Q_{\text{ex}}^{(1)} dr\end{aligned}\tag{C1}$$

where the second expression in equation (C1) is obtained by using equation (8). The monoenergetic collision cross section  $Q_{\text{ex}}^{(1)}$  was calculated from reference 17, and then fitted to the expression

$$Q_{\text{ex}}^{(1)} = (B - C \ln E)^2\tag{C2}$$

where  $B = 5.44$ ,  $C = 0.4442$ , and  $E$  is the relative energy in ergs before the collision.

In order to perform the integration of equation (C1),  $r$  is expressed in terms of the relative energy  $E$ . Since  $g$  is the relative velocity, the relative energy is

$$E = \frac{1}{2} \mu g^2$$

Therefore,

$$r = \sqrt{\frac{\mu}{2kT}} g = \sqrt{\frac{E}{kT}}\tag{C3}$$

$$dr = \frac{1}{2} \frac{dE}{\sqrt{kTE}}\tag{C4}$$

Substituting equations (C3) and (C4) into equation (C1) yields

$$\Omega^{(1,s)} = \frac{1}{2} \sqrt{\frac{2kT}{\pi\mu}} (kT)^{-(s+2)} \int_0^\infty e^{-\frac{E}{kT}} Q_{ex}^{(1)} E^{(s+1)} dE \quad (C5)$$

Then substituting equation (C2) into equation (C5) and integrating give

$$\left. \begin{aligned} \Omega^{(1,1)} &= \frac{1}{2} \sqrt{\frac{2kT}{\pi\mu}} \left[ 2(B - C \ln kT)^2 - 3.691 C(B - C \ln kT) + 2.484 C^2 \right] \\ \Omega^{(1,2)} &= \frac{1}{2} \sqrt{\frac{2kT}{\pi\mu}} \left[ 6(B - C \ln kT)^2 - 15.07 C(B - C \ln kT) + 11.16 C^2 \right] \\ \Omega^{(1,3)} &= \frac{1}{2} \sqrt{\frac{2kT}{\pi\mu}} \left[ 24(B - C \ln kT)^2 - 72.3 C(B - C \ln kT) + 59.75 C^2 \right] \end{aligned} \right\} \quad (C6)$$

The integrals were evaluated by using the tables of reference 27.

#### Hydrogen Atom - Electron Collision Integral

The collision integral is given in terms of the monoenergetic cross section by equation (8)

$$\Omega^{(l,s)} = \sqrt{\frac{kT}{2\pi\mu}} \int_0^\infty e^{-\gamma^2} \gamma^{(2s+3)} Q^{(l)} d\gamma \quad (8)$$

For H-e collisions, the monoenergetic collision cross sections  $Q^{(1)}$  are given in terms of their phase shift angle by

$$Q^{(1)} = \frac{\pi\hbar^2}{m^2 g^2} (\sin^2 \delta_0^- + 3 \sin^2 \delta_0^+) \quad (C7)$$

$$Q^{(2)} = \frac{2\pi\hbar^2}{3m^2 g^2} (\sin^2 \delta_0^- + 3 \sin^2 \delta_0^+)$$

where  $\delta_0^+$  and  $\delta_0^-$  are the triplet and singlet phase shift angles, respectively, and  $g$  is approximately the velocity of the electron. Values of  $\delta_0^+$  and  $\delta_0^-$  are given in reference 21 in terms of the velocity of the electron.

In order to perform the integration of equation (7) when equation (C7) is substituted into it, the quantity  $\sin^2 \delta_0^- + 3 \sin^2 \delta_0^+$  was fitted to a fourth-degree polynomial in the velocity. The fit gave

$$\begin{aligned} \sin^2 \delta_0^- + 3 \sin^2 \delta_0^+ &= -2.30975 \times 10^{-1} + 2.72458 \times 10^{-8} g + 3.25887 \times 10^{-16} g^2 \\ &\quad - 3.9323 \times 10^{-24} g^3 + 1.1137 \times 10^{-32} g^4 \end{aligned} \quad (C8)$$

where  $g$  is in centimeters per second.

Substituting  $\gamma = \sqrt{\frac{\mu}{2kT}} g$  and equation (C8) into equation (8) results in

$$\Omega(1,s) = \frac{1}{2\sqrt{\pi}} \left( \frac{\mu}{2kT} \right)^{\frac{2s+3}{2}} \sum_{j=0}^4 \left( \frac{\pi \hbar^2 A_j}{m^2} \right) \int_0^{\infty} g^{2s+j+1} e^{-\frac{\mu g^2}{2kT}} dg \quad (C9)$$

$$\Omega(2,s) = \frac{1}{3\sqrt{\pi}} \left( \frac{\mu}{2kT} \right)^{\frac{2s+3}{2}} \sum_{j=0}^4 \left( \frac{\pi \hbar^2 A_j}{m^2} \right) \int_0^{\infty} g^{2s+j+1} e^{-\frac{\mu g^2}{2kT}} dg \quad (C10)$$

where the  $A_j$ 's are the coefficients of the  $g$ 's in equation (C8).

The result of integrating equation (C9) can be written as

$$\Omega(1,s) = \sum_{j=0}^4 \Omega_j^{(1,s)} \quad (C11)$$

where

$$\Omega_j^{(1,s)} = \begin{cases} \frac{\pi}{2} \left( \frac{\mu}{2kT} \right)^{\frac{1-j}{2}} \left( \frac{\hbar^2 A_j}{m^2} \right) \frac{1 \cdot 3 \cdot 5 \dots (j+2s)}{2 \left( \frac{j+2s+3}{2} \right)} & \text{for } j \text{ odd} \\ \frac{\sqrt{\pi}}{4} \left( \frac{\mu}{2kT} \right)^{\frac{1-j}{2}} \left( \frac{\hbar^2 A_j}{m^2} \right) \left( \frac{j+2s}{2} \right)! & \text{for } j \text{ even} \end{cases} \quad (C12)$$

Integration of equation (C10) yields

$$\Omega(2,s) = \frac{2}{3} \Omega(1,s) \quad (C13)$$

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TABLE I. - COLLISION CROSS SECTIONS AND HYDROGEN TRANSPORT  
PARAMETERS FOR NONCOULOMBIC COLLISIONS

Temperature, $T_e$ °K	Collision cross sections, Å <sup>2</sup>				
	$\bar{\Omega}_{H-H^+}^{(1,1)}$	$\bar{\Omega}_{H-e}^{(1,1)}$	$\bar{\Omega}_{H-H}^{(2,2)}$	$\bar{\Omega}_{H-H^+}^{(2,2)}$	$\bar{\Omega}_{H-e}^{(2,2)}$
5.00E 03	27.6808	6.84999	3.35220	13.6044	5.80929
5.50E 03	27.3268	6.55407	3.22881	13.0136	5.52577
6.00E 03	27.0056	6.28725	3.11816	12.4854	5.27146
6.50E 03	26.7119	6.04483	3.01804	12.0090	5.04163
7.00E 03	26.4413	5.82318	2.92579	11.5759	4.83259
7.50E 03	26.1907	5.61944	2.84308	11.1798	4.64144
8.00E 03	25.9573	5.43128	2.76586	10.8153	4.46585
8.50E 03	25.7390	5.25682	2.69429	10.4783	4.30390
9.00E 03	25.5341	5.09448	2.62766	10.1653	4.15403
9.50E 03	25.3409	4.94294	2.56539	9.87344	4.01492
1.00E 04	25.1584	4.80108	2.50700	9.60041	3.88546
1.05E 04	24.9854	4.66796	2.45209	9.34415	3.76472
1.10E 04	24.8210	4.54276	2.40029	9.10295	3.65188
1.15E 04	24.6645	4.42477	2.35131	8.87532	3.54625
1.20E 04	24.5150	4.31339	2.30489	8.65999	3.44721
1.25E 04	24.3721	4.20806	2.26079	8.45585	3.35423
1.30E 04	24.2352	4.10832	2.21883	8.26194	3.26684
1.35E 04	24.1038	4.01374	2.17882	8.07738	3.18463
1.40E 04	23.9775	3.92395	2.14051	7.90144	3.10722
1.45E 04	23.8560	3.83862	2.10406	7.73344	3.03429
1.50E 04	23.7389	3.75744	2.06905	7.57278	2.96553
1.55E 04	23.6259	3.68015	2.03567	7.41893	2.90069
1.60E 04	23.5167	3.60650	2.00322	7.27140	2.83952
1.65E 04	23.4112	3.53627	1.97220	7.12976	2.78179
1.70E 04	23.3090	3.46926	1.94235	6.99363	2.72732
1.75E 04	23.2100	3.40528	1.91358	6.86264	2.67592
1.80E 04	23.1140	3.34417	1.88582	6.73648	2.62742
1.85E 04	23.0209	3.28578	1.85903	6.61484	2.58166
1.90E 04	22.9303	3.22995	1.83313	6.49746	2.53852
1.95E 04	22.8424	3.17656	1.80808	6.38409	2.49786
2.00E 04	22.7568	3.12549	1.78383	6.27451	2.45955
2.05E 04	22.6734	3.07663	1.76034	6.16851	2.42349
2.10E 04	22.5923	3.02988	1.73757	6.06589	2.38958
2.15E 04	22.5131	2.98513	1.71547	5.96647	2.35772
2.20E 04	22.4360	2.94230	1.69403	5.87010	2.32782
2.25E 04	22.3607	2.90131	1.67319	5.77652	2.29980
2.30E 04	22.2871	2.86208	1.65294	5.68588	2.27357
2.35E 04	22.2153	2.82453	1.63325	5.59776	2.24908
2.40E 04	22.1451	2.78859	1.61409	5.51214	2.22624
2.45E 04	22.0764	2.75421	1.59543	5.42889	2.20500
2.50E 04	22.0093	2.72132	1.57725	5.34792	2.18529
2.55E 04	21.9435	2.68987	1.55954	5.26911	2.16706
2.60E 04	21.8792	2.65980	1.54227	5.19239	2.15025
2.65E 04	21.8161	2.63106	1.52543	5.11765	2.13482
2.70E 04	21.7544	2.60360	1.50899	5.04483	2.12071
2.75E 04	21.6938	2.57739	1.49294	4.97383	2.10788
2.80E 04	21.6344	2.55237	1.47726	4.90459	2.09629
2.85E 04	21.5762	2.52851	1.46194	4.83704	2.08591
2.90E 04	21.5190	2.50577	1.44697	4.77111	2.07668
2.95E 04	21.4629	2.48411	1.43233	4.70674	2.06857
3.00E 04	21.4078	2.46350	1.41801	4.64387	2.06155
3.05E 04	21.3537	2.44390	1.40400	4.58245	2.05559
3.10E 04	21.3005	2.42529	1.39028	4.52243	2.05065
3.15E 04	21.2483	2.40764	1.37685	4.46376	2.04670
3.20E 04	21.1969	2.39091	1.36370	4.40638	2.04373
3.25E 04	21.1464	2.37508	1.35081	4.35027	2.04168
3.30E 04	21.0967	2.36013	1.33818	4.29536	2.04056
3.35E 04	21.0479	2.34602	1.32580	4.24163	2.04031
3.40E 04	20.9998	2.33274	1.31366	4.18903	2.04094
3.45E 04	20.9524	2.32027	1.30175	4.13753	2.04240
3.50E 04	20.9058	2.30857	1.29007	4.08709	2.04468
3.55E 04	20.8599	2.29764	1.27861	4.03768	2.04776
3.60E 04	20.8147	2.28745	1.26736	3.98927	2.05162
3.65E 04	20.7702	2.27798	1.25631	3.94182	2.05623
3.70E 04	20.7263	2.26922	1.24545	3.89531	2.06159
3.75E 04	20.6831	2.26114	1.23480	3.84971	2.06767
3.80E 04	20.6404	2.25373	1.22433	3.80499	2.07445
3.85E 04	20.5984	2.24698	1.21405	3.76112	2.08192
3.90E 04	20.5570	2.24087	1.20393	3.71808	2.09006
3.95E 04	20.5161	2.23538	1.19399	3.67585	2.09886
4.00E 04	20.4758	2.23050	1.18422	3.63439	2.10831
4.05E 04	20.4360	2.22621	1.17461	3.59369	2.11838



TABLE I. - Concluded. COLLISION CROSS SECTIONS AND HYDROGEN TRANSPORT  
PARAMETERS FOR NONCOULOMBIC COLLISIONS

Temperature, T, °K	Dimensionless parameters					
	$A_{H-H^+}^*$	$B_{H-H^+}^*$	$C_{H-H^+}^*$	$A_{H-e}^*$	$B_{H-e}^*$	$C_{H-e}^*$
5.00E 03	0.49148	1.08697	0.95518	0.84809	1.28732	0.84809
5.50E 03	0.47622	1.08751	0.95489	0.84310	1.29423	0.84310
6.00E 03	0.46233	1.08801	0.95462	0.83844	1.30055	0.83844
6.50E 03	0.44957	1.08848	0.95437	0.83404	1.30633	0.83404
7.00E 03	0.43780	1.08891	0.95414	0.82989	1.31157	0.82989
7.50E 03	0.42686	1.08932	0.95392	0.82596	1.31628	0.82596
8.00E 03	0.41666	1.08971	0.95372	0.82224	1.32048	0.82224
8.50E 03	0.40710	1.09007	0.95352	0.81873	1.32417	0.81873
9.00E 03	0.39811	1.09042	0.95334	0.81540	1.32735	0.81540
9.50E 03	0.38962	1.09075	0.95315	0.81225	1.33003	0.81225
1.00E 04	0.38160	1.09107	0.95299	0.80929	1.33220	0.80929
1.05E 04	0.37398	1.09137	0.95283	0.80650	1.33387	0.80650
1.10E 04	0.36674	1.09166	0.95257	0.80389	1.33504	0.80389
1.15E 04	0.35984	1.09194	0.95252	0.80145	1.33570	0.80145
1.20E 04	0.35325	1.09221	0.95238	0.79919	1.33585	0.79919
1.25E 04	0.34695	1.09247	0.95224	0.79710	1.33549	0.79710
1.30E 04	0.34091	1.09272	0.95211	0.79518	1.33462	0.79518
1.35E 04	0.33511	1.09296	0.95198	0.79343	1.33324	0.79343
1.40E 04	0.32954	1.09319	0.95185	0.79186	1.33134	0.79186
1.45E 04	0.32417	1.09342	0.95173	0.79046	1.32892	0.79046
1.50E 04	0.31900	1.09364	0.95151	0.78924	1.32598	0.78924
1.55E 04	0.31402	1.09386	0.95149	0.78820	1.32252	0.78820
1.60E 04	0.30920	1.09407	0.95138	0.78733	1.31853	0.78733
1.65E 04	0.30454	1.09427	0.95127	0.78665	1.31402	0.78665
1.70E 04	0.30004	1.09447	0.95117	0.78614	1.30899	0.78614
1.75E 04	0.29568	1.09466	0.95105	0.78581	1.30343	0.78581
1.80E 04	0.29145	1.09485	0.95095	0.78557	1.29734	0.78557
1.85E 04	0.28734	1.09503	0.95085	0.78571	1.29072	0.78571
1.90E 04	0.28336	1.09521	0.95077	0.78593	1.28359	0.78593
1.95E 04	0.27948	1.09539	0.95057	0.78634	1.27592	0.78634
2.00E 04	0.27572	1.09556	0.95058	0.78693	1.26774	0.78693
2.05E 04	0.27206	1.09573	0.95049	0.78771	1.25904	0.78771
2.10E 04	0.26849	1.09589	0.95040	0.78857	1.24982	0.78857
2.15E 04	0.26502	1.09605	0.95031	0.78982	1.24009	0.78982
2.20E 04	0.26164	1.09621	0.95023	0.79116	1.22985	0.79116
2.25E 04	0.25834	1.09637	0.95014	0.79258	1.21911	0.79258
2.30E 04	0.25512	1.09652	0.95005	0.79438	1.20787	0.79438
2.35E 04	0.25198	1.09667	0.94999	0.79627	1.19614	0.79627
2.40E 04	0.24891	1.09682	0.94990	0.79834	1.18393	0.79834
2.45E 04	0.24591	1.09696	0.94982	0.80059	1.17124	0.80059
2.50E 04	0.24298	1.09710	0.94975	0.80302	1.15808	0.80302
2.55E 04	0.24012	1.09724	0.94957	0.80554	1.14446	0.80554
2.60E 04	0.23732	1.09738	0.94950	0.80843	1.13039	0.80843
2.65E 04	0.23458	1.09751	0.94953	0.81139	1.11587	0.81139
2.70E 04	0.23190	1.09765	0.94946	0.81453	1.10093	0.81453
2.75E 04	0.22927	1.09778	0.94939	0.81784	1.08557	0.81784
2.80E 04	0.22670	1.09790	0.94932	0.82131	1.06979	0.82131
2.85E 04	0.22418	1.09803	0.94925	0.82495	1.05362	0.82495
2.90E 04	0.22172	1.09816	0.94918	0.82876	1.03707	0.82876
2.95E 04	0.21930	1.09828	0.94911	0.83272	1.02015	0.83272
3.00E 04	0.21692	1.09840	0.94905	0.83684	1.00287	0.83684
3.05E 04	0.21460	1.09852	0.94898	0.84111	0.98524	0.84111
3.10E 04	0.21232	1.09864	0.94892	0.84553	0.96729	0.84553
3.15E 04	0.21008	1.09875	0.94885	0.85009	0.94902	0.85009
3.20E 04	0.20788	1.09887	0.94880	0.85479	0.93045	0.85479
3.25E 04	0.20572	1.09898	0.94874	0.85963	0.91160	0.85963
3.30E 04	0.20360	1.09909	0.94859	0.86460	0.89247	0.86460
3.35E 04	0.20152	1.09920	0.94852	0.86969	0.87310	0.86969
3.40E 04	0.19948	1.09931	0.94855	0.87491	0.85349	0.87491
3.45E 04	0.19747	1.09942	0.94850	0.88024	0.83365	0.88024
3.50E 04	0.19550	1.09952	0.94844	0.88569	0.81361	0.88569
3.55E 04	0.19356	1.09963	0.94839	0.89125	0.79338	0.89125
3.60E 04	0.19166	1.09973	0.94833	0.89690	0.77298	0.89690
3.65E 04	0.18978	1.09983	0.94827	0.90266	0.75243	0.90266
3.70E 04	0.18794	1.09994	0.94822	0.90850	0.73173	0.90850
3.75E 04	0.18613	1.10004	0.94817	0.91444	0.71091	0.91444
3.80E 04	0.18435	1.10013	0.94811	0.92045	0.68998	0.92045
3.85E 04	0.18259	1.10023	0.94805	0.92654	0.66896	0.92654
3.90E 04	0.18087	1.10033	0.94801	0.93270	0.64786	0.93270
3.95E 04	0.17917	1.10042	0.94796	0.93893	0.62671	0.93893
4.00E 04	0.17750	1.10052	0.94791	0.94522	0.60550	0.94522
4.05E 04	0.17585	1.10061	0.94785	0.95156	0.58427	0.95156

TABLE II. - TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(a) Pressure,  $10^{-5}$  atmosphere

Temperature, °K	Mole fractions		Binary diffusion coefficients, cm <sup>2</sup> /sec			Thermal diffusion coefficients, g/(cm)(sec)		
T	x <sub>H</sub>	x <sub>H+</sub>	D <sub>H-H+</sub>	D <sub>H+-e</sub>	D <sub>H-e</sub>	D <sub>H</sub> <sup>T</sup>	D <sub>H+</sub> <sup>T</sup>	D <sub>e</sub> <sup>T</sup>
5.00E 03	0.99744	0.10783E-02	0.69650E 07	0.97261E 06	0.96768E 09	-0.31212E-07	0.29613E-07	0.15993E-08
5.50E 03	0.98985	0.50738E-02	0.65915E 07	0.14544E 07	0.88636E 09	-0.32037E-06	0.31365E-06	0.67147E-08
6.00E 03	0.96214	0.18428E-01	0.64704E 07	0.20923E 07	0.80031E 09	-0.18061E-05	0.17920E-05	0.14090E-07
6.50E 03	0.92226	0.53872E-01	0.76215E 07	0.29105E 07	0.79430E 09	-0.51080E-05	0.50858E-05	0.22290E-07
7.00E 03	0.74338	0.12831	0.10232E 08	0.39249E 07	0.84948E 09	-0.82741E-05	0.82438E-05	0.30306E-07
7.50E 03	0.50535	0.24532	0.13628E 08	0.51321E 07	0.94036E 09	-0.87239E-05	0.86869E-05	0.36919E-07
8.00E 03	0.26290	0.36855	0.16849E 08	0.65032E 07	0.10545E 10	-0.61936E-05	0.61516E-05	0.41949E-07
8.50E 03	0.10461	0.44765	0.19535E 08	0.80121E 07	0.11861E 10	-0.30364E-05	0.29898E-05	0.46635E-07
9.00E 03	0.31440E-01	0.48128	0.21879E 08	0.96758E 07	0.13312E 10	-0.12141E-05	0.11619E-05	0.52186E-07
9.50E 03	0.13702E-01	0.49315	0.24126E 08	0.11531E 08	0.14872E 10	-0.47231E-06	0.41366E-06	0.58648E-07
1.00E 04	0.53849E-02	0.49731	0.26392E 08	0.13608E 08	0.16533E 10	-0.19356E-06	0.12778E-06	0.65784E-07
1.05E 04	0.22580E-02	0.49885	0.28716E 08	0.15926E 08	0.18294E 10	-0.85475E-07	0.11995E-07	0.73480E-07
1.10E 04	0.10657E-02	0.49947	0.31113E 08	0.18504E 08	0.20157E 10	-0.40872E-07	-0.40826E-07	0.81698E-07
1.15E 04	0.53730E-03	0.49973	0.33588E 08	0.21360E 08	0.22121E 10	-0.69230E-07	-0.69230E-07	0.90429E-07
1.20E 04	0.29451E-03	0.49985	0.36141E 08	0.24508E 08	0.24188E 10	-0.11951E-07	-0.87723E-07	0.99675E-07
1.25E 04	0.17051E-03	0.49991	0.38771E 08	0.27967E 08	0.26359E 10	-0.73375E-08	-0.10210E-06	0.10944E-06
1.30E 04	0.11509E-03	0.49994	0.41480E 08	0.31752E 08	0.28635E 10	-0.49023E-08	-0.11483E-06	0.11973E-06
1.35E 04	0.81326E-04	0.49996	0.44266E 08	0.35880E 08	0.31016E 10	-0.35456E-08	-0.12701E-06	0.13056E-06
1.40E 04	0.61650E-04	0.49997	0.47125E 08	0.40369E 08	0.33505E 10	-0.27485E-08	-0.13917E-06	0.14192E-06
1.45E 04	0.49500E-04	0.49998	0.49506E 08	0.45236E 08	0.36101E 10	-0.22547E-08	-0.15157E-06	0.15383E-06
1.50E 04	0.41561E-04	0.49998	0.53081E 08	0.50499E 08	0.38805E 10	-0.19325E-08	-0.16436E-06	0.16629E-06
1.55E 04	0.36070E-04	0.49998	0.56170E 08	0.56174E 08	0.41617E 10	-0.17108E-08	-0.17760E-06	0.17931E-06
1.60E 04	0.32001E-04	0.49998	0.59333E 08	0.62281E 08	0.44538E 10	-0.15501E-08	-0.19134E-06	0.19289E-06
1.65E 04	0.29006E-04	0.49999	0.62569E 08	0.68836E 08	0.47569E 10	-0.14285E-08	-0.20562E-06	0.20705E-06
1.70E 04	0.26577E-04	0.49999	0.65879E 08	0.75859E 08	0.50708E 10	-0.13327E-08	-0.22045E-06	0.22178E-06
1.75E 04	0.24580E-04	0.49999	0.69261E 08	0.83367E 08	0.53957E 10	-0.12536E-08	-0.23584E-06	0.23710E-06
1.80E 04	0.22890E-04	0.49999	0.72715E 08	0.91380E 08	0.57314E 10	-0.11868E-08	-0.25181E-06	0.25300E-06
1.85E 04	0.21428E-04	0.49999	0.76240E 08	0.99915E 08	0.60780E 10	-0.11290E-08	-0.26837E-06	0.26950E-06
1.90E 04	0.20147E-04	0.49999	0.79837E 08	0.10899E 09	0.64354E 10	-0.10780E-08	-0.28552E-06	0.28600E-06
1.95E 04	0.19007E-04	0.49999	0.83504E 08	0.11863E 09	0.68035E 10	-0.10323E-08	-0.30327E-06	0.30430E-06
2.00E 04	0.17979E-04	0.49999	0.87242E 08	0.12885E 09	0.71824E 10	-0.99069E-09	-0.32163E-06	0.32262E-06
2.05E 04	0.17047E-04	0.49999	0.91049E 08	0.13967E 09	0.75717E 10	-0.95256E-09	-0.34060E-06	0.34155E-06
2.10E 04	0.16158E-04	0.49999	0.94925E 08	0.15111E 09	0.79716E 10	-0.91738E-09	-0.36019E-06	0.36110E-06
2.15E 04	0.15415E-04	0.49999	0.98871E 08	0.16318E 09	0.83817E 10	-0.88450E-09	-0.38040E-06	0.38129E-06
2.20E 04	0.14653E-04	0.49999	0.10288E 09	0.17592E 09	0.88021E 10	-0.85368E-09	-0.40124E-06	0.40210E-06
2.25E 04	0.14022E-04	0.49999	0.10697E 09	0.18934E 09	0.92325E 10	-0.82467E-09	-0.42272E-06	0.42355E-06
2.30E 04	0.13404E-04	0.49999	0.11112E 09	0.20345E 09	0.96728E 10	-0.79757E-09	-0.44484E-06	0.44564E-06
2.35E 04	0.12823E-04	0.49999	0.11533E 09	0.21829E 09	0.10123E 11	-0.77163E-09	-0.46761E-06	0.46838E-06
2.40E 04	0.12286E-04	0.49999	0.11962E 09	0.23386E 09	0.10582E 11	-0.74742E-09	-0.49103E-06	0.49177E-06
2.45E 04	0.11780E-04	0.49999	0.12397E 09	0.25020E 09	0.11051E 11	-0.72414E-09	-0.51510E-06	0.51582E-06
2.50E 04	0.11303E-04	0.49999	0.12839E 09	0.26731E 09	0.11528E 11	-0.70184E-09	-0.53983E-06	0.54053E-06
2.55E 04	0.10863E-04	0.49999	0.13287E 09	0.28523E 09	0.12015E 11	-0.68107E-09	-0.56523E-06	0.56591E-06
2.60E 04	0.10446E-04	0.49999	0.13742E 09	0.30398E 09	0.12510E 11	-0.66101E-09	-0.59130E-06	0.59196E-06
2.65E 04	0.10051E-04	0.49999	0.14203E 09	0.32357E 09	0.13013E 11	-0.64169E-09	-0.61804E-06	0.61868E-06
2.70E 04	0.96784E-05	0.50000	0.14671E 09	0.34402E 09	0.13524E 11	-0.62318E-09	-0.64547E-06	0.64609E-06
2.75E 04	0.93208E-05	0.50000	0.15146E 09	0.36537E 09	0.14043E 11	-0.60501E-09	-0.67357E-06	0.67418E-06
2.80E 04	0.89529E-05	0.50000	0.15626E 09	0.38762E 09	0.14569E 11	-0.58824E-09	-0.70237E-06	0.70296E-06
2.85E 04	0.86726E-05	0.50000	0.16114E 09	0.41081E 09	0.15102E 11	-0.57146E-09	-0.73186E-06	0.73243E-06
2.90E 04	0.83745E-05	0.50000	0.16607E 09	0.43495E 09	0.15642E 11	-0.55564E-09	-0.76204E-06	0.76260E-06
2.95E 04	0.80914E-05	0.50000	0.17107E 09	0.46006E 09	0.16188E 11	-0.54039E-09	-0.79293E-06	0.79347E-06
3.00E 04	0.78222E-05	0.50000	0.17614E 09	0.48617E 09	0.16741E 11	-0.52569E-09	-0.82452E-06	0.82505E-06
3.05E 04	0.75658E-05	0.50000	0.18126E 09	0.51330E 09	0.17298E 11	-0.51161E-09	-0.85683E-06	0.85734E-06
3.10E 04	0.73240E-05	0.50000	0.18645E 09	0.54148E 09	0.17862E 11	-0.49769E-09	-0.88985E-06	0.89034E-06
3.15E 04	0.70933E-05	0.50000	0.19170E 09	0.57072E 09	0.18430E 11	-0.48437E-09	-0.92358E-06	0.92407E-06
3.20E 04	0.68785E-05	0.50000	0.19702E 09	0.60105E 09	0.19002E 11	-0.47174E-09	-0.95804E-06	0.95852E-06
3.25E 04	0.66607E-05	0.50000	0.20239E 09	0.63248E 09	0.19579E 11	-0.45885E-09	-0.99323E-06	0.99369E-06
3.30E 04	0.64557E-05	0.50000	0.20783E 09	0.66505E 09	0.20159E 11	-0.44661E-09	-0.10291E-05	0.10296E-05
3.35E 04	0.62660E-05	0.50000	0.21333E 09	0.69878E 09	0.20743E 11	-0.43466E-09	-0.10658E-05	0.10662E-05
3.40E 04	0.60872E-05	0.50000	0.21889E 09	0.73369E 09	0.21339E 11	-0.42342E-09	-0.11032E-05	0.11036E-05
3.45E 04	0.59038E-05	0.50000	0.22451E 09	0.76980E 09	0.21920E 11	-0.41194E-09	-0.11413E-05	0.11417E-05
3.50E 04	0.57444E-05	0.50000	0.23019E 09	0.80714E 09	0.22511E 11	-0.40135E-09	-0.11802E-05	0.11806E-05
3.55E 04	0.55805E-05	0.50000	0.23593E 09	0.84572E 09	0.23105E 11	-0.39048E-09	-0.12198E-05	0.12202E-05
3.60E 04	0.54241E-05	0.50000	0.24174E 09	0.88558E 09	0.23700E 11	-0.37990E-09	-0.12602E-05	0.12606E-05
3.65E 04	0.52700E-05	0.50000	0.24760E 09	0.92674E 09	0.24296E 11	-0.36968E-09	-0.13014E-05	0.13017E-05
3.70E 04	0.51335E-05	0.50000	0.25352E 09	0.96922E 09	0.24892E 11	-0.35975E-09	-0.13433E-05	0.13436E-05
3.75E 04	0.49954E-05	0.50000	0.25950E 09	0.10130E 10	0.25489E 11	-0.35023E-09	-0.13860E-05	0.13863E-05
3.80E 04	0.48653E-05	0.50000	0.26554E 09	0.10582E 10	0.26086E 11	-0.34054E-09	-0.14294E-05	0.14297E-05
3.85E 04	0.47406E-05	0.50000	0.27164E 09	0.11048E 10	0.26683E 11	-0.33170E-09	-0.14736E-05	0.14739E-05
3.90E 04	0.46154E-05	0.50000	0.27780E 09	0.11528E 10	0.27279E 11	-0.32213E-09	-0.15186E-05	0.15189E-05
3.95E 04	0.45076E-05	0.50000	0.28402E 09	0.12023E 10	0.27873E 11	-0.31357E-09	-0.15644E-05	0.15647E-05
4.00E 04	0.43959E-05	0.50000	0.29030E 09	0.12532E 10	0.28466E 11	-0.30483E-09	-0.16109E-05	0.16112E-05
4.05E 04	0.42841E-05	0.50000	0.29663E 09	0.13056E 10	0.29057E 11	-0.29579E-09	-0.16583E-05	0.16586E-05

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(a) Continued. Pressure,  $10^{-5}$  atmosphere

Temperature, °K	Thermal conductivity, cal/(cm)(sec)(°K)				Viscosity, g/(cm)(sec)	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec		
	Transla- tional	Reaction	Diffusional	Total		$D_{H-H^+}$	$D_{H^+-e}$	$D_{H-e}$
T	$\lambda_t$	$\lambda_r$	$\lambda_d$	$\lambda$	$\eta$			
5.00E 03	0.41368E-C2	0.17270E-C3	0.23956E-05	0.43095E-02	0.55282E-03	0.33666E 07	0.39085E 10	0.25349E 10
5.50E 03	0.44351E-C2	0.70347E-C3	0.16129E-04	0.51386E-02	0.58662E-03	0.39172E 07	0.24730E 10	0.48943E 10
6.00E 03	0.42454E-C2	0.22070E-C2	0.65808E-04	0.65524E-02	0.57224E-03	0.45025E 07	0.12602E 10	0.71042E 10
6.50E 03	0.26143E-C2	0.54938E-C2	0.20458E-03	0.91081E-02	0.46752E-03	0.51333E 07	0.60572E 09	0.88743E 10
7.00E 03	0.25953E-C2	0.10772E-C1	0.48540E-03	0.13367E-01	0.29820E-03	0.58065E 07	0.29193E 09	0.10404E 11
7.50E 03	0.16154E-C2	0.15673E-C1	0.81314E-03	0.17293E-01	0.14938E-03	0.65121E 07	0.13841E 09	0.11844E 11
8.00E 03	0.85057E-C3	0.14765E-01	0.83505E-03	0.15656E-01	0.61845E-04	0.72453E 07	0.63243E 08	0.13263E 11
8.50E 03	0.51852E-C3	0.82850E-C2	0.49249E-03	0.88035E-02	0.23414E-04	0.80062E 07	0.30274E 08	0.14693E 11
9.00E 03	0.39322E-C3	0.33235E-02	0.20581E-03	0.37167E-02	0.96576E-05	0.87952E 07	0.18296E 08	0.16155E 11
9.50E 03	0.37666E-C3	0.12217E-C2	0.70728E-04	0.15963E-02	0.51390E-05	0.96127E 07	0.14992E 08	0.17662E 11
1.00E 04	0.39518E-C3	0.46442E-C3	0.31100E-04	0.35960E-03	0.37214E-05	0.10459E 08	0.15039E 08	0.19218E 11
1.05E 04	0.43056E-C3	0.18958E-C3	0.13168E-04	0.62054E-03	0.33706E-05	0.11332E 08	0.16503E 08	0.20824E 11
1.10E 04	0.47465E-C3	0.83898E-C4	0.60342E-05	0.55795E-03	0.34186E-05	0.12233E 08	0.18695E 08	0.22481E 11
1.15E 04	0.52167E-03	0.40376E-04	0.30022E-05	0.56205E-03	0.36338E-05	0.13161E 08	0.21364E 08	0.24187E 11
1.20E 04	0.57282E-C3	0.21181E-C4	0.16259E-05	0.59400E-03	0.39300E-05	0.14116E 08	0.24420E 08	0.25941E 11
1.25E 04	0.62711E-C3	0.12135E-C4	0.96043E-06	0.63924E-03	0.42730E-05	0.15097E 08	0.27833E 08	0.27744E 11
1.30E 04	0.68440E-C3	0.75854E-C5	0.61830E-06	0.69198E-03	0.46487E-05	0.16104E 08	0.31599E 08	0.29595E 11
1.35E 04	0.74464E-C3	0.51459E-C5	0.43153E-06	0.74979E-03	0.50505E-05	0.17136E 08	0.35725E 08	0.31492E 11
1.40E 04	0.80784E-C3	0.37502E-05	0.32324E-06	0.81159E-03	0.54756E-05	0.18194E 08	0.40223E 08	0.33436E 11
1.45E 04	0.87400E-C3	0.28985E-C5	0.25655E-06	0.87690E-03	0.59227E-05	0.19277E 08	0.45109E 08	0.35426E 11
1.50E 04	0.94316E-C3	0.23453E-C5	0.21301E-06	0.94550E-03	0.63913E-05	0.20385E 08	0.50400E 08	0.37461E 11
1.55E 04	0.10153E-C2	0.19638E-C5	0.18287E-06	0.10173E-02	0.68811E-05	0.21516E 08	0.56112E 08	0.39541E 11
1.60E 04	0.10505E-C2	0.16858E-C5	0.16085E-06	0.10922E-02	0.73921E-05	0.22672E 08	0.62264E 08	0.41666E 11
1.65E 04	0.11688E-C2	0.14744E-C5	0.14405E-06	0.11703E-02	0.79244E-05	0.23852E 08	0.68873E 08	0.43834E 11
1.70E 04	0.12502E-C2	0.13071E-C5	0.13089E-06	0.12515E-02	0.84781E-05	0.25056E 08	0.75960E 08	0.46046E 11
1.75E 04	0.13347E-C2	0.11707E-05	0.11972E-06	0.13359E-02	0.90534E-05	0.26283E 08	0.83542E 08	0.48301E 11
1.80E 04	0.14224E-C2	0.10566E-05	0.11045E-06	0.14234E-02	0.96505E-05	0.27533E 08	0.91639E 08	0.50598E 11
1.85E 04	0.15132E-C2	0.95438E-06	0.10247E-06	0.15142E-02	0.10269E-04	0.28806E 08	0.10027E 09	0.52938E 11
1.90E 04	0.16073E-C2	0.87548E-C6	0.95495E-07	0.16082E-02	0.10910E-04	0.30102E 08	0.10946E 09	0.55319E 11
1.95E 04	0.17046E-C2	0.80220E-06	0.89321E-07	0.17054E-02	0.11574E-04	0.31424E 08	0.11921E 09	0.57742E 11
2.00E 04	0.18051E-C2	0.73746E-C6	0.83784E-07	0.18060E-02	0.12260E-04	0.32761E 08	0.12957E 09	0.60206E 11
2.05E 04	0.19051E-C2	0.68001E-C6	0.78798E-07	0.19098E-02	0.12968E-04	0.34124E 08	0.14053E 09	0.62711E 11
2.10E 04	0.20163E-C2	0.62870E-C6	0.74277E-07	0.20169E-02	0.13699E-04	0.35509E 08	0.15213E 09	0.65256E 11
2.15E 04	0.21269E-C2	0.58252E-06	0.70142E-07	0.21274E-02	0.14454E-04	0.36916E 08	0.16439E 09	0.67841E 11
2.20E 04	0.22408E-C2	0.54082E-C6	0.66347E-07	0.22413E-02	0.15231E-04	0.38344E 08	0.17732E 09	0.70467E 11
2.25E 04	0.23581E-C2	0.50302E-C6	0.62850E-07	0.23586E-02	0.16032E-04	0.39794E 08	0.19094E 09	0.73131E 11
2.30E 04	0.24789E-C2	0.46884E-C6	0.59643E-07	0.24793E-02	0.16857E-04	0.41265E 08	0.20529E 09	0.75835E 11
2.35E 04	0.26031E-C2	0.43753E-C6	0.56653E-07	0.26035E-02	0.17705E-04	0.42758E 08	0.22037E 09	0.78578E 11
2.40E 04	0.27302E-C2	0.40914E-C6	0.53906E-07	0.27312E-02	0.18577E-04	0.44271E 08	0.23621E 09	0.81359E 11
2.45E 04	0.28619E-C2	0.38300E-C6	0.51332E-07	0.28623E-02	0.19473E-04	0.45806E 08	0.25283E 09	0.84179E 11
2.50E 04	0.29566E-C2	0.35896E-C6	0.48926E-07	0.29570E-02	0.20393E-04	0.47361E 08	0.27026E 09	0.87037E 11
2.55E 04	0.31349E-C2	0.33712E-C6	0.46716E-07	0.31352E-02	0.21338E-04	0.48936E 08	0.28851E 09	0.89932E 11
2.60E 04	0.32767E-C2	0.31689E-C6	0.44634E-07	0.32770E-02	0.22307E-04	0.50533E 08	0.30761E 09	0.92866E 11
2.65E 04	0.34221E-C2	0.29818E-C6	0.42677E-07	0.34224E-02	0.23301E-04	0.52149E 08	0.32757E 09	0.95836E 11
2.70E 04	0.35711E-C2	0.28088E-C6	0.40842E-07	0.35714E-02	0.24320E-04	0.53786E 08	0.34843E 09	0.98844E 11
2.75E 04	0.37233E-C2	0.26471E-C6	0.39095E-07	0.37240E-02	0.25364E-04	0.55442E 08	0.37020E 09	0.10189E 12
2.80E 04	0.38801E-C2	0.25002E-C6	0.37496E-07	0.38803E-02	0.26433E-04	0.57119E 08	0.39291E 09	0.10497E 12
2.85E 04	0.40401E-C2	0.23611E-C6	0.35949E-07	0.40403E-02	0.27527E-04	0.58816E 08	0.41657E 09	0.10809E 12
2.90E 04	0.42038E-C2	0.22333E-C6	0.34515E-07	0.42040E-02	0.28647E-04	0.60532E 08	0.44122E 09	0.11124E 12
2.95E 04	0.43712E-C2	0.21144E-C6	0.33160E-07	0.43714E-02	0.29792E-04	0.62268E 08	0.46687E 09	0.11443E 12
3.00E 04	0.45424E-C2	0.20037E-C6	0.31883E-07	0.45426E-02	0.30963E-04	0.64023E 08	0.49355E 09	0.11766E 12
3.05E 04	0.47173E-C2	0.19008E-C6	0.30683E-07	0.47175E-02	0.32160E-04	0.65798E 08	0.52128E 09	0.12092E 12
3.10E 04	0.48960E-C2	0.18036E-C6	0.29527E-07	0.48962E-02	0.33384E-04	0.67592E 08	0.55009E 09	0.12422E 12
3.15E 04	0.50786E-C2	0.17135E-C6	0.28445E-07	0.50787E-02	0.34633E-04	0.69405E 08	0.57999E 09	0.12755E 12
3.20E 04	0.52649E-C2	0.16301E-C6	0.27436E-07	0.52651E-02	0.35909E-04	0.71238E 08	0.61101E 09	0.13092E 12
3.25E 04	0.54551E-C2	0.15496E-C6	0.26438E-07	0.54553E-02	0.37211E-04	0.73089E 08	0.64318E 09	0.13432E 12
3.30E 04	0.56454E-C2	0.14754E-C6	0.25510E-07	0.56453E-02	0.38540E-04	0.74959E 08	0.67652E 09	0.13776E 12
3.35E 04	0.58472E-C2	0.14053E-C6	0.24623E-07	0.58473E-02	0.39896E-04	0.76848E 08	0.71106E 09	0.14123E 12
3.40E 04	0.60490E-C2	0.13409E-C6	0.23803E-07	0.60492E-02	0.41278E-04	0.78756E 08	0.74681E 09	0.14473E 12
3.45E 04	0.62548E-C2	0.12786E-C6	0.22993E-07	0.62550E-02	0.42688E-04	0.80682E 08	0.78380E 09	0.14827E 12
3.50E 04	0.64646E-C2	0.12215E-C6	0.22249E-07	0.64647E-02	0.44125E-04	0.82627E 08	0.82206E 09	0.15185E 12
3.55E 04	0.66783E-C2	0.11663E-C6	0.21513E-07	0.66784E-02	0.45589E-04	0.84590E 08	0.86161E 09	0.15545E 12
3.60E 04	0.68960E-C2	0.11144E-C6	0.20814E-07	0.68961E-02	0.47081E-04	0.86571E 08	0.90248E 09	0.15910E 12
3.65E 04	0.71177E-C2	0.10657E-C6	0.20150E-07	0.71178E-02	0.48600E-04	0.88571E 08	0.94468E 09	0.16277E 12
3.70E 04	0.73434E-C2	0.10199E-C6	0.19521E-07	0.73435E-02	0.50147E-04	0.90589E 08	0.98925E 09	0.16648E 12
3.75E 04	0.75732E-C2	0.97707E-C7	0.18927E-07	0.75733E-02	0.51722E-04	0.92625E 08	0.10332E 10	0.17022E 12
3.80E 04	0.78070E-C2	0.93551E-C7	0.18339E-07	0.78071E-02	0.53324E-04	0.94679E 08	0.10796E 10	0.17399E 12
3.85E 04	0.80449E-C2	0.89802E-C7	0.17812E-07	0.80450E-02	0.54955E-04	0.96751E 08	0.11274E 10	0.17780E 12
3.90E 04	0.82870E-C2	0.86026E-C7	0.17263E-07	0.82870E-02	0.56614E-04	0.98840E 08	0.11767E 10	0.18164E 12
3.95E 04	0.85321E-C2	0.82635E-C7	0.16775E-07	0.85322E-02	0.58302E-04	0.10095E 09	0.12275E 10	0.18552E 12
4.00E 04	0.87833E-C2	0.79343E-C7	0.16291E-07	0.87834E-02	0.60018E-04	0.10307E 09	0.12798E 10	0.18942E 12
4.05E 04	0.90377E-C2	0.76149E-C7	0.15812E-07	0.90378E-02	0.61762E-04	0.10522E 09	0.13336E 10	0.19336E 12

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(a) Continued. Pressure,  $10^{-5}$  atmosphere

Temperature, °K	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec			Shielded coulombic collision cross sections, Å <sup>2</sup>		Dimensionless parameters for shielded coulombic collisions		
T	D <sub>H<sup>+</sup>-H</sub>	D <sub>e-H</sub>	D <sub>e-H<sup>+</sup></sub>	$\bar{\Omega}_c(1,1)$	$\bar{\Omega}_c(2,2)$	A <sub>c</sub> <sup>*</sup>	F <sub>c</sub> <sup>*</sup>	C <sub>c</sub> <sup>*</sup>
5.00E 03	0.33659E C7	0.25770E 09	0.25646E 09	4883.56	5162.80	1.05718	1.03808	0.37145
5.50E 03	0.35154E C7	0.17105E 09	0.16848E 09	3766.58	3997.35	1.06127	1.04080	0.37418
6.00E 03	0.45004E 07	0.93847E C8	0.90044E 08	2982.36	3176.27	1.06502	1.04330	0.37668
6.50E 03	0.51307E C7	0.51129E C8	0.46346E 08	2416.84	2582.06	1.06836	1.04553	0.37891
7.00E 03	0.58035E C7	0.30846E C8	0.25226E 08	2002.50	2144.97	1.07114	1.04738	0.38076
7.50E 03	0.65086E C7	0.21558E 08	0.15197E 08	1698.21	1822.32	1.07308	1.04867	0.38205
8.00E 03	0.72414E C7	0.17986E C8	0.10819E 08	1476.34	1585.41	1.07388	1.04921	0.38259
8.50E 03	0.80019E C7	0.17586E C8	0.96488E 07	1312.39	1409.01	1.07367	1.04903	0.38241
9.00E 03	0.87905E C7	0.18939E C8	0.10215E 08	1184.09	1270.27	1.07278	1.04847	0.38186
9.50E 03	0.96075E C7	0.21172E 08	0.11638E 08	1077.57	1154.92	1.07178	1.04781	0.38119
1.00E 04	0.10453E C8	0.23904E C8	0.13535E 08	986.247	1056.06	1.07078	1.04714	0.38052
1.05E 04	0.11326E C8	0.27003E 08	0.15772E 08	906.716	970.034	1.06983	1.04651	0.37989
1.10E 04	0.12226E 08	0.30425E C8	0.18311E 08	836.825	894.518	1.06894	1.04592	0.37929
1.15E 04	0.13154E C8	0.34178E C8	0.21146E 08	774.997	827.782	1.06811	1.04536	0.37874
1.20E 04	0.14108E C8	0.38256E C8	0.24295E 08	720.001	768.478	1.06733	1.04484	0.37822
1.25E 04	0.15089E C8	0.42678E C8	0.27743E 08	670.842	715.520	1.06660	1.04435	0.37773
1.30E 04	0.16055E C8	0.47457E C8	0.31533E 08	626.709	668.016	1.06591	1.04390	0.37727
1.35E 04	0.17127E C8	0.52611E C8	0.35674E 08	586.927	625.230	1.06526	1.04346	0.37684
1.40E 04	0.18184E C8	0.58195E C8	0.40180E 08	550.933	586.549	1.06465	1.04306	0.37643
1.45E 04	0.19267E C8	0.64107E C8	0.45072E 08	518.253	551.455	1.06407	1.04267	0.37604
1.50E 04	0.20374E C8	0.70485E C8	0.50365E 08	488.485	519.511	1.06351	1.04230	0.37568
1.55E 04	0.21505E C8	0.77306E C8	0.56079E 08	461.289	490.346	1.06299	1.04195	0.37533
1.60E 04	0.22660E C8	0.84588E C8	0.62232E 08	436.372	463.641	1.06249	1.04162	0.37499
1.65E 04	0.23839E C8	0.92351E C8	0.68842E 08	413.482	439.123	1.06201	1.04130	0.37468
1.70E 04	0.25042E C8	0.10061E 09	0.75929E 08	392.401	416.556	1.06156	1.04100	0.37437
1.75E 04	0.26265E C8	0.10939E 09	0.83511E 08	372.942	395.736	1.06112	1.04071	0.37408
1.80E 04	0.27518E C8	0.1187CE 09	0.91608E 08	354.938	376.484	1.06070	1.04043	0.37380
1.85E 04	0.28791E 08	0.12857E C9	0.10024E 09	338.247	358.644	1.06030	1.04016	0.37353
1.90E 04	0.30086E C8	0.13902E C9	0.10942E 09	322.742	342.079	1.05992	1.03990	0.37328
1.95E 04	0.31403E C8	0.15006E C9	0.11918E 09	308.310	326.669	1.05955	1.03966	0.37303
2.00E 04	0.32744E C8	0.16171E 09	0.12953E 09	294.855	312.307	1.05919	1.03942	0.37279
2.05E 04	0.34106E C8	0.17400E C9	0.14050E 09	282.288	298.899	1.05884	1.03919	0.37256
2.10E 04	0.35490E C8	0.18694E 09	0.15210E 09	270.531	286.361	1.05851	1.03897	0.37234
2.15E 04	0.36896E C8	0.20055E C9	0.16435E 09	259.516	274.618	1.05819	1.03876	0.37213
2.20E 04	0.38324E C8	0.21486E C9	0.17728E 09	249.180	263.604	1.05788	1.03855	0.37192
2.25E 04	0.39773E C8	0.22989E C9	0.19091E 09	239.468	253.258	1.05758	1.03835	0.37172
2.30E 04	0.41243E 08	0.24565E C9	0.20525E 09	230.330	243.526	1.05729	1.03816	0.37153
2.35E 04	0.42735E C8	0.26217E C9	0.22033E 09	221.720	234.361	1.05701	1.03797	0.37134
2.40E 04	0.44248E C8	0.27946E C9	0.23617E 09	213.599	225.718	1.05674	1.03779	0.37116
2.45E 04	0.45781E C8	0.29756E C9	0.25280E 09	205.929	217.559	1.05647	1.03761	0.37098
2.50E 04	0.47336E C8	0.31648E C9	0.27022E 09	198.677	209.846	1.05622	1.03744	0.37081
2.55E 04	0.48910E C9	0.33624E C9	0.28847E 09	191.812	202.548	1.05597	1.03728	0.37065
2.60E 04	0.50506E C8	0.35686E 09	0.30757E 09	185.308	195.634	1.05573	1.03711	0.37048
2.65E 04	0.52121E C8	0.37837E 09	0.32753E 09	179.138	189.079	1.05549	1.03696	0.37033
2.70E 04	0.53757E C8	0.40078E C9	0.34839E 09	173.281	182.857	1.05526	1.03680	0.37017
2.75E 04	0.55413E C8	0.42413E C9	0.37016E 09	167.715	176.945	1.05504	1.03665	0.37003
2.80E 04	0.57089E C8	0.44843E 09	0.39286E 09	162.420	171.324	1.05482	1.03651	0.36988
2.85E 04	0.58785E C8	0.47370E 09	0.41653E 09	157.380	165.974	1.05461	1.03637	0.36974
2.90E 04	0.60500E 08	0.49998E 09	0.44117E 09	152.577	160.877	1.05440	1.03623	0.36960
2.95E 04	0.62235E C8	0.52727E C9	0.46683E 09	147.997	156.019	1.05420	1.03610	0.36947
3.00E 04	0.63990E C8	0.55560E C9	0.49350E 09	143.626	151.383	1.05400	1.03597	0.36934
3.05E 04	0.65763E C8	0.58500E C9	0.52123E 09	139.452	146.956	1.05381	1.03584	0.36921
3.10E 04	0.67557E C8	0.61545E C9	0.55004E 09	135.462	142.727	1.05362	1.03571	0.36908
3.15E 04	0.69369E C8	0.64705E C9	0.57994E 09	131.646	138.682	1.05344	1.03559	0.36896
3.20E 04	0.71200E 08	0.67983E C9	0.61096E 09	127.994	134.811	1.05326	1.03547	0.36884
3.25E 04	0.73051E C8	0.71373E C9	0.64313E 09	124.496	131.105	1.05309	1.03536	0.36872
3.30E 04	0.74920E 08	0.74880E C9	0.67647E 09	121.143	127.554	1.05291	1.03524	0.36861
3.35E 04	0.76808E C8	0.78505E C9	0.71100E 09	117.928	124.149	1.05275	1.03513	0.36850
3.40E 04	0.78714E C8	0.82261E 09	0.74675E 09	114.843	120.882	1.05258	1.03502	0.36839
3.45E 04	0.80640E C8	0.86138E C9	0.78374E 09	111.881	117.746	1.05242	1.03491	0.36828
3.50E 04	0.82583E C8	0.90143E C9	0.82200E 09	109.035	114.734	1.05226	1.03481	0.36818
3.55E 04	0.84546E C8	0.94278E C9	0.86155E 09	106.300	111.839	1.05211	1.03470	0.36807
3.60E 04	0.86526E C8	0.98546E C9	0.90242E 09	103.669	109.055	1.05196	1.03460	0.36797
3.65E 04	0.88525E C8	0.10295E 10	0.94462E 09	101.137	106.377	1.05181	1.03451	0.36787
3.70E 04	0.90542E C8	0.10749E 10	0.98819E 09	98.6997	103.799	1.05166	1.03441	0.36778
3.75E 04	0.92577E C8	0.11217E 10	0.10332E 10	96.3518	101.316	1.05152	1.03431	0.36768
3.80E 04	0.94630E C8	0.11699E 10	0.10795E 10	94.0890	98.9233	1.05138	1.03422	0.36759
3.85E 04	0.96700E C8	0.12196E 10	0.11274E 10	91.9073	96.6168	1.05124	1.03413	0.36750
3.90E 04	0.98789E C8	0.12703E 10	0.11766E 10	89.8026	94.3923	1.05111	1.03404	0.36741
3.95E 04	0.10090E 09	0.13234E 10	0.12274E 10	87.7715	92.2457	1.05097	1.03395	0.36732
4.00E 04	0.10302E C9	0.13776E 10	0.12797E 10	85.8105	90.1735	1.05084	1.03386	0.36723
4.05E 04	0.10516E C9	0.14334E 10	0.13336E 10	83.9163	88.1722	1.05072	1.03378	0.36714

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(a) Concluded. Pressure,  $10^{-5}$  atmosphere

Temperature, °K	Pure gas thermal conductivity, cal/(cm)(sec)(°K)		Pure gas viscosity, g/(cm)(sec)		Binary mixture thermal conductivity parameter, cal (cm)(sec)(°K)	Viscosity parameter, g/(cm)(sec)	Electrical conductivity second approximation parameter	Electrical conductivity, mhos/m
T	$\lambda_{H^+}$	$\lambda_e$	$\eta_{H^+}$	$\eta_e$	$\lambda_{H^+-e}$	$\eta_{H^+-e}$	$\Delta_c$	$\sigma$
5.00E C3	0.27135E-05	0.11632E-03	0.36705E-06	0.85622E-08	0.82276E-04	0.12109E-07	0.99303E-01	165.720
5.50E C3	0.36751E-05	0.15757E-03	0.49721E-06	0.11598E-07	0.11145E-03	0.16403E-07	0.25702	405.656
6.00E C3	0.46315E-05	0.20712E-03	0.65356E-06	0.15246E-07	0.14650E-03	0.21561E-07	0.34522	655.343
6.50E C3	0.61061E-05	0.26519E-03	0.83679E-06	0.19520E-07	0.18757E-03	0.27605E-07	0.37798	863.600
7.00E C3	0.77278E-05	0.33128E-03	0.10453E-05	0.24385E-07	0.23431E-03	0.34485E-07	0.38899	1043.21
7.50E C3	0.94153E-05	0.40362E-03	0.12736E-05	0.29709E-07	0.28548E-03	0.42015E-07	0.39265	1205.45
8.00E C3	0.11177E-04	0.47915E-03	0.15119E-05	0.35269E-07	0.33890E-03	0.49877E-07	0.39421	1350.78
8.50E C3	0.12563E-04	0.55573E-03	0.17536E-05	0.40905E-07	0.39307E-03	0.57849E-07	0.39547	1479.28
9.00E C3	0.14756E-04	0.63430E-03	0.20015E-05	0.46688E-07	0.44864E-03	0.66027E-07	0.39675	1597.54
9.50E C3	0.16726E-04	0.71677E-03	0.22617E-05	0.52759E-07	0.50697E-03	0.74612E-07	0.39799	1712.45
1.00E C4	0.18766E-04	0.80423E-03	0.25377E-05	0.59197E-07	0.56883E-03	0.83171E-07	0.39916	1827.29
1.05E C4	0.20928E-04	0.89717E-03	0.28310E-05	0.66038E-07	0.63457E-03	0.93392E-07	0.40024	1943.22
1.10E C4	0.23229E-04	0.99581E-03	0.31422E-05	0.73298E-07	0.70433E-03	0.10366E-06	0.40125	2060.60
1.15E C4	0.25666E-04	0.11003E-02	0.34718E-05	0.80988E-07	0.77822E-03	0.11453E-06	0.40220	2179.52
1.20E C4	0.28241E-04	0.12167E-02	0.38202E-05	0.89114E-07	0.85631E-03	0.12603E-06	0.40308	2300.01
1.25E C4	0.30957E-04	0.13371E-02	0.41876E-05	0.97683E-07	0.93865E-03	0.13814E-06	0.40391	2422.03
1.30E C4	0.33815E-04	0.14496E-02	0.45742E-05	0.10670E-06	0.10253E-02	0.15090E-06	0.40468	2545.58
1.35E C4	0.36817E-04	0.15783E-02	0.49803E-05	0.11617E-06	0.11163E-02	0.16430E-06	0.40542	2670.61
1.40E C4	0.39966E-04	0.17133E-02	0.54061E-05	0.12611E-06	0.12118E-02	0.17834E-06	0.40612	2797.09
1.45E C4	0.42261E-04	0.18544E-02	0.58520E-05	0.13651E-06	0.13117E-02	0.19305E-06	0.40678	2925.00
1.50E C4	0.46706E-04	0.20023E-02	0.63180E-05	0.14738E-06	0.14162E-02	0.20843E-06	0.40740	3054.31
1.55E C4	0.50303E-04	0.21564E-02	0.68044E-05	0.15873E-06	0.15252E-02	0.22447E-06	0.40800	3184.99
1.60E C4	0.54051E-04	0.23171E-02	0.73115E-05	0.17055E-06	0.16389E-02	0.24120E-06	0.40857	3317.02
1.65E C4	0.57954E-04	0.24844E-02	0.78394E-05	0.18287E-06	0.17572E-02	0.25862E-06	0.40911	3450.36
1.70E C4	0.62012E-04	0.26584E-02	0.83884E-05	0.19568E-06	0.18803E-02	0.27673E-06	0.40963	3585.00
1.75E C4	0.66228E-04	0.28391E-02	0.89586E-05	0.20898E-06	0.20081E-02	0.29554E-06	0.41012	3720.92
1.80E C4	0.70602E-04	0.30266E-02	0.95503E-05	0.22278E-06	0.21407E-02	0.31506E-06	0.41060	3858.08
1.85E C4	0.75136E-04	0.32210E-02	0.10164E-04	0.23709E-06	0.22782E-02	0.33529E-06	0.41106	3996.48
1.90E C4	0.79832E-04	0.34223E-02	0.10799E-04	0.25190E-06	0.24206E-02	0.35625E-06	0.41150	4136.09
1.95E C4	0.84651E-04	0.36306E-02	0.11456E-04	0.26724E-06	0.25679E-02	0.37793E-06	0.41192	4276.89
2.00E C4	0.89714E-04	0.38455E-02	0.12136E-04	0.28309E-06	0.27202E-02	0.40034E-06	0.41233	4418.87
2.05E C4	0.94903E-04	0.40684E-02	0.12837E-04	0.29946E-06	0.28776E-02	0.42350E-06	0.41272	4562.01
2.10E C4	0.10026E-03	0.42980E-02	0.13562E-04	0.31636E-06	0.30400E-02	0.44740E-06	0.41310	4706.29
2.15E C4	0.10578E-03	0.45343E-02	0.14309E-04	0.33379E-06	0.32075E-02	0.47205E-06	0.41346	4851.69
2.20E C4	0.11146E-03	0.47785E-02	0.15080E-04	0.35176E-06	0.33801E-02	0.49746E-06	0.41382	4998.20
2.25E C4	0.11734E-03	0.50303E-02	0.15873E-04	0.37027E-06	0.35580E-02	0.52364E-06	0.41416	5145.81
2.30E C4	0.12330E-03	0.52892E-02	0.16690E-04	0.38932E-06	0.37410E-02	0.55058E-06	0.41449	5294.50
2.35E C4	0.12959E-03	0.55554E-02	0.17530E-04	0.40892E-06	0.39293E-02	0.57829E-06	0.41481	5444.25
2.40E C4	0.13595E-03	0.58292E-02	0.18394E-04	0.42907E-06	0.41230E-02	0.60679E-06	0.41513	5595.06
2.45E C4	0.14254E-03	0.61105E-02	0.19281E-04	0.44977E-06	0.43219E-02	0.63607E-06	0.41543	5746.91
2.50E C4	0.14920E-03	0.63994E-02	0.20193E-04	0.47104E-06	0.45263E-02	0.66615E-06	0.41572	5899.78
2.55E C4	0.15620E-03	0.66959E-02	0.21129E-04	0.49287E-06	0.47360E-02	0.69702E-06	0.41601	6053.67
2.60E C4	0.16329E-03	0.70002E-02	0.22089E-04	0.51526E-06	0.49512E-02	0.72869E-06	0.41629	6208.57
2.65E C4	0.17057E-03	0.73122E-02	0.23073E-04	0.53823E-06	0.51719E-02	0.76117E-06	0.41656	6364.46
2.70E C4	0.17803E-03	0.76320E-02	0.24082E-04	0.56177E-06	0.53981E-02	0.79446E-06	0.41682	6521.32
2.75E C4	0.18569E-03	0.79597E-02	0.25116E-04	0.58589E-06	0.56299E-02	0.82857E-06	0.41708	6679.16
2.80E C4	0.19350E-03	0.82952E-02	0.26175E-04	0.61059E-06	0.58672E-02	0.86350E-06	0.41733	6837.96
2.85E C4	0.20152E-03	0.86387E-02	0.27259E-04	0.63587E-06	0.61102E-02	0.89926E-06	0.41757	6997.71
2.90E C4	0.20972E-03	0.89903E-02	0.28368E-04	0.66174E-06	0.63588E-02	0.93585E-06	0.41781	7158.40
2.95E C4	0.21810E-03	0.93498E-02	0.29503E-04	0.68821E-06	0.66131E-02	0.97327E-06	0.41804	7320.02
3.00E C4	0.22668E-03	0.97174E-02	0.30663E-04	0.71527E-06	0.68731E-02	0.10115E-05	0.41826	7482.56
3.05E C4	0.23544E-03	0.10093E-01	0.31849E-04	0.74293E-06	0.71389E-02	0.10507E-05	0.41848	7646.01
3.10E C4	0.24440E-03	0.10477E-01	0.33060E-04	0.77119E-06	0.74105E-02	0.10906E-05	0.41870	7810.37
3.15E C4	0.25355E-03	0.10869E-01	0.34298E-04	0.80006E-06	0.76879E-02	0.11315E-05	0.41891	7975.62
3.20E C4	0.26269E-03	0.11270E-01	0.35561E-04	0.82953E-06	0.79711E-02	0.11731E-05	0.41912	8141.76
3.25E C4	0.27243E-03	0.11679E-01	0.36851E-04	0.85962E-06	0.82603E-02	0.12157E-05	0.41932	8308.77
3.30E C4	0.28219E-03	0.12096E-01	0.38167E-04	0.89033E-06	0.85553E-02	0.12591E-05	0.41952	8476.66
3.35E C4	0.29206E-03	0.12521E-01	0.39510E-04	0.92165E-06	0.88563E-02	0.13034E-05	0.41971	8645.41
3.40E C4	0.30221E-03	0.12955E-01	0.40880E-04	0.95359E-06	0.91632E-02	0.13486E-05	0.41990	8815.01
3.45E C4	0.31253E-03	0.13398E-01	0.42276E-04	0.98616E-06	0.94762E-02	0.13946E-05	0.42008	8985.46
3.50E C4	0.32305E-03	0.13849E-01	0.43699E-04	0.10194E-05	0.97952E-02	0.14416E-05	0.42027	9156.75
3.55E C4	0.33377E-03	0.14308E-01	0.45149E-04	0.10532E-05	0.10120E-01	0.14894E-05	0.42044	9328.87
3.60E C4	0.34469E-03	0.14777E-01	0.46626E-04	0.10877E-05	0.10451E-01	0.15382E-05	0.42062	9501.82
3.65E C4	0.35582E-03	0.15253E-01	0.48131E-04	0.11228E-05	0.10789E-01	0.15878E-05	0.42079	9675.59
3.70E C4	0.36716E-03	0.15739E-01	0.49663E-04	0.11585E-05	0.11132E-01	0.16384E-05	0.42096	9850.17
3.75E C4	0.37867E-03	0.16233E-01	0.51223E-04	0.11949E-05	0.11482E-01	0.16898E-05	0.42112	10025.6
3.80E C4	0.39041E-03	0.16736E-01	0.52811E-04	0.12319E-05	0.11838E-01	0.17422E-05	0.42128	10201.8
3.85E C4	0.40235E-03	0.17248E-01	0.54426E-04	0.12696E-05	0.12200E-01	0.17955E-05	0.42144	10378.7
3.90E C4	0.41450E-03	0.17769E-01	0.56069E-04	0.13079E-05	0.12568E-01	0.18497E-05	0.42160	10556.5
3.95E C4	0.42689E-03	0.18299E-01	0.57740E-04	0.13469E-05	0.12943E-01	0.19048E-05	0.42175	10735.1
4.00E C4	0.43942E-03	0.18837E-01	0.59440E-04	0.13866E-05	0.13324E-01	0.19609E-05	0.42190	10914.4
4.05E C4	0.45219E-03	0.19385E-01	0.61168E-04	0.14269E-05	0.13711E-01	0.20179E-05	0.42205	11094.5

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(b) Pressure,  $10^{-4}$  atmosphere

Temperature, °K	Mole fractions		Binary diffusion coefficients, $\text{cm}^2/\text{sec}$			Thermal diffusion coefficients, $\text{g}/(\text{cm})(\text{sec})$		
	$x_{\text{H}}$	$x_{\text{H}^+}$	$\mathcal{D}_{\text{H-H}^+}$	$\mathcal{D}_{\text{H}^+-e}$	$\mathcal{D}_{\text{H-e}}$	$D_{\text{H}}^T$	$D_{\text{H}^+}^T$	$D_e^T$
5.00E 03	C.99932	O.34123E-C3	O.76779E 06	O.10408E 06	O.10848E 09	-0.89270E-08	O.86234E-08	O.30365E-09
5.50E 03	O.99678	O.16101E-02	O.80919E 06	O.15645E 06	O.11398E 09	-0.52602E-07	O.49939E-07	O.26622E-08
6.00E 03	C.98319	C.59028E-02	O.78585E 06	O.22627E 06	O.10774E 09	-0.37164E-06	O.36282E-06	O.88246E-08
6.50E 03	C.96457	C.17713E-C1	O.77847E 06	O.31670E 06	O.99896E 08	-0.16825E-05	O.16650E-05	O.17499E-07
7.00E 03	C.91020	O.44898E-01	O.87122E 06	O.43069E 06	O.97979E 08	-0.45024E-05	O.44752E-05	O.27197E-07
7.50E 03	C.84455	C.97527E-C1	O.10939E 07	O.57050E 06	O.10203E 09	-0.77230E-05	O.76859E-05	O.37072E-07
8.00E 03	O.62711	C.18144	O.14147E 07	O.73670E 06	O.11019E 09	-0.94142E-05	O.93680E-05	O.46215E-07
8.50E 03	C.42748	C.28626	O.17625E 07	O.92734E 06	O.12117E 09	-0.86818E-05	O.86277E-05	O.54160E-07
9.00E 03	O.23570	C.38215	O.20824E 07	O.11385E 07	O.13431E 09	-0.61206E-05	O.60595E-05	O.61145E-07
9.50E 03	C.11092	O.44454	O.23619E 07	O.13681E 07	O.14922E 09	-0.34082E-05	O.33401E-05	O.68070E-07
1.00E 04	C.46813E-C1	C.47555	O.26158E 07	O.16183E 07	O.16554E 09	-0.16590E-05	O.15833E-05	O.75648E-07
1.05E 04	C.21677E-C1	C.48916	O.28606E 07	O.18931E 07	O.18304E 09	-0.78312E-06	O.69900E-06	O.84114E-07
1.10E 04	C.10076E-C1	O.49496	O.31059E 07	O.21962E 07	O.20162E 09	-0.37966E-06	O.28640E-06	O.93257E-07
1.15E 04	O.49646E-C2	C.49752	O.33559E 07	O.25303E 07	O.22124E 09	-0.19342E-06	O.90386E-07	O.10303E-06
1.20E 04	C.26025E-02	O.4987C	O.36125E 07	O.26976E 07	O.24189E 09	-0.10437E-06	-0.90332E-08	O.11340E-06
1.25E 04	C.14530E-02	O.49927	O.38762E 07	O.33002E 07	O.26360E 09	-0.59831E-07	-0.64533E-07	O.12436E-06
1.30E 04	O.66462E-03	O.49957	O.41474E 07	O.37401E 07	O.28635E 09	-0.36492E-07	-0.99420E-07	O.13591E-06
1.35E 04	C.58250E-C3	O.49973	O.44262E 07	O.42190E 07	O.31017E 09	-0.23696E-07	-0.12435E-06	O.14805E-06
1.40E 04	C.37061E-C3	O.49981	O.47126E 07	O.47391E 07	O.33505E 09	-0.16371E-07	-0.14441E-06	O.16078E-06
1.45E 04	O.26553E-C3	O.49987	O.50065E 07	O.53022E 07	O.36101E 09	-0.12009E-07	-0.16212E-06	O.17412E-06
1.50E 04	O.21157E-C3	O.4999C	O.53080E 07	O.59103E 07	O.38805E 09	-0.92837E-08	-0.17878E-06	O.18806E-06
1.55E 04	O.16025E-03	O.49992	O.56169E 07	O.65653E 07	O.41617E 09	-0.75273E-08	-0.19509E-06	O.20267E-06
1.60E 04	C.13259E-C3	O.49993	O.59332E 07	O.72693E 07	O.44539E 09	-0.63466E-08	-0.21145E-06	O.21780E-06
1.65E 04	O.11328E-C3	O.49994	O.62568E 07	O.80241E 07	O.47569E 09	-0.55217E-08	-0.22809E-06	O.23361E-06
1.70E 04	O.59240E-C4	O.49995	O.65878E 07	O.88320E 07	O.50708E 09	-0.49231E-08	-0.24513E-06	O.25005E-06
1.75E 04	C.86655E-C4	O.49996	O.69260E 07	O.96499E 07	O.53957E 09	-0.44729E-08	-0.26266E-06	O.26714E-06
1.80E 04	C.80387E-C4	O.49996	O.72714E 07	O.10615E 08	O.57314E 09	-0.41225E-08	-0.28074E-06	O.28487E-06
1.85E 04	C.72736E-C4	O.49996	O.76240E 07	O.11594E 08	O.60780E 09	-0.38413E-08	-0.29941E-06	O.30325E-06
1.90E 04	O.68230E-C4	O.49997	O.79837E 07	O.12634E 08	O.64354E 09	-0.36088E-08	-0.31868E-06	O.32229E-06
1.95E 04	C.63572E-C4	O.49997	O.83504E 07	O.13738E 08	O.68036E 09	-0.34121E-08	-0.33859E-06	O.34200E-06
2.00E 04	C.55567E-C4	O.49997	O.87241E 07	O.14907E 08	O.71824E 09	-0.32426E-08	-0.35913E-06	O.36238E-06
2.05E 04	C.56050E-C4	O.49997	O.91048E 07	O.16144E 08	O.75718E 09	-0.30931E-08	-0.38034E-06	O.38343E-06
2.10E 04	O.52928E-C4	O.49997	O.94925E 07	O.17451E 08	O.79716E 09	-0.29595E-08	-0.40220E-06	O.40516E-06
2.15E 04	O.50126E-C4	O.49997	O.98870E 07	O.18830E 08	O.83818E 09	-0.28386E-08	-0.42475E-06	O.42759E-06
2.20E 04	C.47593E-C4	O.49998	O.10288E 08	O.20283E 08	O.88021E 09	-0.27283E-08	-0.44797E-06	O.45070E-06
2.25E 04	C.42283E-C4	O.49998	O.10697E 08	O.21812E 08	O.92325E 09	-0.26266E-08	-0.47189E-06	O.47451E-06
2.30E 04	C.43167E-C4	O.49998	O.11112E 08	O.23420E 08	O.96728E 09	-0.25324E-08	-0.49650E-06	O.49903E-06
2.35E 04	C.41218E-C4	O.49998	O.11533E 08	O.25110E 08	O.10123E 10	-0.24446E-08	-0.52181E-06	O.52475E-06
2.40E 04	C.39415E-C4	O.49998	O.11962E 08	O.26882E 08	O.10582E 10	-0.23623E-08	-0.54783E-06	O.55019E-06
2.45E 04	C.37731E-C4	O.49998	O.12397E 08	O.28740E 08	O.11051E 10	-0.22842E-08	-0.57456E-06	O.57684E-06
2.50E 04	O.36174E-C4	O.49998	O.12839E 08	O.30685E 08	O.11528E 10	-0.22112E-08	-0.60201E-06	O.60422E-06
2.55E 04	C.34766E-C4	O.49998	O.13287E 08	O.32721E 08	O.12015E 10	-0.21411E-08	-0.63019E-06	O.63233E-06
2.60E 04	O.33342E-C4	O.49998	O.13742E 08	O.34849E 08	O.12510E 10	-0.20752E-08	-0.65910E-06	O.66117E-06
2.65E 04	C.32053E-C4	O.49998	O.14203E 08	O.37072E 08	O.13013E 10	-0.20118E-08	-0.68874E-06	O.69075E-06
2.70E 04	O.30846E-C4	O.49998	O.14671E 08	O.39392E 08	O.13524E 10	-0.19516E-08	-0.71913E-06	O.72108E-06
2.75E 04	C.29766E-C4	O.49999	O.15145E 08	O.41811E 08	O.14043E 10	-0.18938E-08	-0.75025E-06	O.75215E-06
2.80E 04	C.28733E-C4	O.49999	O.15626E 08	O.44333E 08	O.14569E 10	-0.18385E-08	-0.78213E-06	O.78397E-06
2.85E 04	C.27613E-C4	O.49999	O.16114E 08	O.46958E 08	O.15102E 10	-0.17851E-08	-0.81477E-06	O.81655E-06
2.90E 04	O.26651E-C4	O.49999	O.16607E 08	O.49691E 08	O.15642E 10	-0.17339E-08	-0.84816E-06	O.84990E-06
2.95E 04	C.25742E-C4	O.49999	O.17107E 08	O.52532E 08	O.16188E 10	-0.16847E-08	-0.88232E-06	O.88400E-06
3.00E 04	C.24878E-C4	O.49999	O.17614E 08	O.55485E 08	O.16741E 10	-0.16372E-08	-0.91725E-06	O.91888E-06
3.05E 04	C.24059E-C4	O.49999	O.18126E 08	O.58552E 08	O.17298E 10	-0.15914E-08	-0.95295E-06	O.95454E-06
3.10E 04	C.23264E-C4	O.49999	O.18645E 08	O.61736E 08	O.17862E 10	-0.15473E-08	-0.98943E-06	O.99097E-06
3.15E 04	O.22539E-C4	O.49999	O.19170E 08	O.65038E 08	O.18430E 10	-0.15042E-08	-0.10267E-05	O.10282E-05
3.20E 04	C.21831E-C4	O.49999	O.19702E 08	O.68462E 08	O.19032E 10	-0.14625E-08	-0.10647E-05	O.10662E-05
3.25E 04	O.21160E-C4	O.49999	O.20239E 08	O.72010E 08	O.19579E 10	-0.14223E-08	-0.11036E-05	O.11050E-05
3.30E 04	C.20519E-C4	O.49999	O.20783E 08	O.75685E 08	O.20159E 10	-0.13833E-08	-0.11432E-05	O.11446E-05
3.35E 04	O.19901E-C4	O.49999	O.21333E 08	O.79488E 08	O.20743E 10	-0.13448E-08	-0.11837E-05	O.11850E-05
3.40E 04	C.19320E-C4	O.49999	O.21889E 08	O.83423E 08	O.21330E 10	-0.13081E-08	-0.12249E-05	O.12262E-05
3.45E 04	C.18761E-C4	O.49999	O.22451E 08	O.87492E 08	O.21920E 10	-0.12721E-08	-0.12669E-05	O.12682E-05
3.50E 04	O.18224E-C4	O.49999	O.23019E 08	O.91698E 08	O.22511E 10	-0.12370E-08	-0.13098E-05	O.13110E-05
3.55E 04	C.17710E-C4	O.49999	O.23593E 08	O.96044E 08	O.23105E 10	-0.12026E-08	-0.13535E-05	O.13547E-05
3.60E 04	O.17219E-C4	O.49999	O.24174E 08	O.10053E 09	O.23700E 10	-0.11692E-08	-0.13980E-05	O.13991E-05
3.65E 04	C.16749E-C4	O.49999	O.24760E 08	O.10516E 09	O.24296E 10	-0.11366E-08	-0.14433E-05	O.14444E-05
3.70E 04	O.16259E-C4	O.49999	O.25352E 08	O.10994E 09	O.24892E 10	-0.11046E-08	-0.14895E-05	O.14906E-05
3.75E 04	C.15843E-C4	O.49999	O.25950E 08	O.11487E 09	O.25489E 10	-0.10734E-08	-0.15364E-05	O.15375E-05
3.80E 04	C.15445E-C4	O.49999	O.26554E 08	O.11995E 09	O.26086E 10	-0.10428E-08	-0.15843E-05	O.15853E-05
3.85E 04	C.15043E-C4	O.49999	O.27164E 08	O.12519E 09	O.26683E 10	-0.10126E-08	-0.16329E-05	O.16339E-05
3.90E 04	O.14656E-C4	O.49999	O.27780E 08	O.13058E 09	O.27279E 10	-0.98313E-09	-0.16824E-05	O.16834E-05
3.95E 04	C.14250E-C4	O.49999	O.28402E 08	O.13613E 09	O.27873E 10	-0.95467E-09	-0.17328E-05	O.17337E-05
4.00E 04	O.13833E-C4	O.49999	O.29030E 08	O.14185E 09	O.28466E 10	-0.92621E-09	-0.17840E-05	O.17849E-05
4.05E 04	O.13502E-C4	O.49999	O.29663E 08	O.14773E 09	O.29057E 10	-0.89837E-09	-0.18361E-05	O.18370E-05

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(b) Continued. Pressure,  $10^{-4}$  atmosphere

Temperature, °K	Thermal conductivity, cal/(cm)(sec)(°K)				Viscosity, g/(cm)(sec)	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec		
	Transla- tional	Reaction	Diffusional	Total		D <sub>H-H<sup>+</sup></sub>	D <sub>H<sup>+</sup>-e</sub>	D <sub>H-e</sub>
T	$\lambda_t$	$\lambda_r$	$\lambda_d$	$\lambda$	$\eta$			
5.00E C3	0.41544E-C2	0.54965E-04	0.34485E-06	0.41894E-02	0.55517E-03	0.33749E 06	0.51585E 09	0.13830E 09
5.50E C3	0.45186E-C2	0.22636E-C3	0.36408E-05	0.47452E-02	0.69095E-03	0.39335E 06	0.43919E 09	0.31351E 09
6.00E C3	0.48110E-C2	0.72872E-C3	0.17667E-04	0.55403E-02	0.63213E-03	0.45193E 06	0.30311E 09	0.54878E 09
6.50E C3	0.47779E-C2	0.19230E-02	0.58657E-04	0.67099E-02	0.62138E-03	0.51381E 06	0.17950E 09	0.77798E 09
7.00E C3	0.42034E-C2	0.42661E-02	0.15607E-03	0.84695E-02	0.53760E-03	0.57982E 06	0.10057E 09	0.97285E 09
7.50E C3	0.33025E-C2	0.75845E-02	0.34171E-03	0.11287E-01	0.39099E-03	0.64999E 06	0.56079E 08	0.11432E 10
8.00E C3	0.22759E-C2	0.12335E-C1	0.60059E-03	0.14711E-01	0.23884E-03	0.72358E 06	0.31153E 08	0.13017E 10
8.50E C3	0.15659E-C2	0.14845E-C1	0.79961E-03	0.16415E-01	0.12627E-03	0.80005E 06	0.16954E 08	0.14555E 10
9.00E C3	0.10021E-C2	0.12831E-C1	0.74377E-03	0.13833E-01	0.60278E-04	0.87923E 06	0.90810E 07	0.16085E 10
9.50E C3	0.70041E-03	0.78655E-C2	0.48074E-03	0.85659E-02	0.27935E-04	0.96114E 06	0.51157E 07	0.17628E 10
1.00E C4	0.56464E-C3	0.38513E-C2	0.24580E-03	0.44361E-02	0.13967E-04	0.10458E 07	0.33668E 07	0.19202E 10
1.05E C4	0.56455E-C3	0.17427E-02	0.11565E-03	0.23072E-02	0.82977E-05	0.11332E 07	0.27190E 07	0.20817E 10
1.10E C4	0.56740E-C3	0.79423E-03	0.54669E-04	0.13816E-02	0.60811E-05	0.12233E 07	0.25870E 07	0.22477E 10
1.15E C4	0.63029E-C3	0.37800E-03	0.26934E-04	0.10083E-02	0.53053E-05	0.13161E 07	0.27054E 07	0.24184E 10
1.20E C4	0.68354E-C3	0.19038E-03	0.14020E-04	0.87392E-03	0.51601E-05	0.14116E 07	0.29591E 07	0.25940E 10
1.25E C4	0.74331E-C3	0.10198E-03	0.77508E-05	0.84528E-03	0.53111E-05	0.15097E 07	0.32975E 07	0.27743E 10
1.30E C4	0.80784E-C3	0.58228E-04	0.45620E-05	0.86607E-03	0.56141E-05	0.16104E 07	0.36984E 07	0.29594E 10
1.35E C4	0.87638E-C3	0.35471E-04	0.28617E-05	0.91185E-03	0.60040E-05	0.17136E 07	0.41519E 07	0.31492E 10
1.40E C4	0.94860E-C3	0.23039E-C4	0.19121E-05	0.97164E-03	0.64498E-05	0.18194E 07	0.46540E 07	0.33436E 10
1.45E C4	0.10243E-C2	0.15909E-04	0.13570E-05	0.10402E-02	0.69364E-05	0.19277E 07	0.52036E 07	0.35426E 10
1.50E C4	0.11035E-C2	0.11617E-C4	0.10176E-05	0.11151E-02	0.74561E-05	0.20385E 07	0.58008E 07	0.37461E 10
1.55E C4	0.11862E-C2	0.89072E-05	0.80063E-06	0.11951E-02	0.80047E-05	0.21516E 07	0.64467E 07	0.39541E 10
1.60E C4	0.12722E-C2	0.71142E-C5	0.65572E-06	0.12793E-02	0.85601E-05	0.22672E 07	0.71428E 07	0.41666E 10
1.65E C4	0.13618E-C2	0.58729E-05	0.55470E-06	0.13676E-02	0.91812E-05	0.23852E 07	0.78907E 07	0.43834E 10
1.70E C4	0.14548E-C2	0.49761E-05	0.48132E-06	0.14597E-02	0.98074E-05	0.25056E 07	0.86925E 07	0.46046E 10
1.75E C4	0.15513E-C2	0.43029E-05	0.42598E-06	0.15556E-02	0.10458E-04	0.26283E 07	0.95499E 07	0.48301E 10
1.80E C4	0.16513E-C2	0.37746E-C5	0.38276E-06	0.16551E-02	0.11134E-04	0.27533E 07	0.10465E 08	0.50598E 10
1.85E C4	0.17549E-C2	0.33611E-C5	0.34800E-06	0.17583E-02	0.11834E-04	0.28806E 07	0.11440E 08	0.52938E 10
1.90E C4	0.18621E-C2	0.30173E-C5	0.31925E-06	0.18651E-02	0.12560E-04	0.30102E 07	0.12477E 08	0.55319E 10
1.95E C4	0.19725E-C2	0.27253E-C5	0.29497E-06	0.19756E-02	0.13310E-04	0.31420E 07	0.13578E 08	0.57742E 10
2.00E C4	0.20873E-C2	0.24844E-C5	0.27413E-06	0.20898E-02	0.14085E-04	0.32761E 07	0.14745E 08	0.60206E 10
2.05E C4	0.22054E-C2	0.22724E-C5	0.25589E-06	0.22077E-02	0.14885E-04	0.34124E 07	0.15981E 08	0.62711E 10
2.10E C4	0.23272E-C2	0.20871E-C5	0.23976E-06	0.23293E-02	0.15711E-04	0.35509E 07	0.17288E 08	0.65256E 10
2.15E C4	0.24526E-C2	0.19236E-C5	0.22534E-06	0.24547E-02	0.16563E-04	0.36916E 07	0.18667E 08	0.67841E 10
2.20E C4	0.25821E-C2	0.17784E-C5	0.21236E-06	0.25838E-02	0.17440E-04	0.38344E 07	0.20122E 08	0.70466E 10
2.25E C4	0.27151E-C2	0.16485E-C5	0.20059E-06	0.27168E-02	0.18343E-04	0.39754E 07	0.21654E 08	0.73131E 10
2.30E C4	0.28520E-C2	0.15317E-C5	0.18986E-06	0.28535E-02	0.19272E-04	0.41265E 07	0.23266E 08	0.75835E 10
2.35E C4	0.29927E-C2	0.14262E-C5	0.18003E-06	0.29941E-02	0.20227E-04	0.42758E 07	0.24960E 08	0.78578E 10
2.40E C4	0.31372E-C2	0.13306E-C5	0.17098E-06	0.31386E-02	0.21209E-04	0.44271E 07	0.26738E 08	0.81359E 10
2.45E C4	0.32857E-C2	0.12432E-C5	0.16258E-06	0.32869E-02	0.22217E-04	0.45806E 07	0.28603E 08	0.84179E 10
2.50E C4	0.34389E-C2	0.11639E-C5	0.15485E-06	0.34391E-02	0.23253E-04	0.47361E 07	0.30558E 08	0.87036E 10
2.55E C4	0.35942E-C2	0.10908E-C5	0.14761E-06	0.35953E-02	0.24315E-04	0.48936E 07	0.32604E 08	0.89932E 10
2.60E C4	0.37545E-C2	0.10241E-C5	0.14092E-06	0.37555E-02	0.25404E-04	0.50533E 07	0.34744E 08	0.92865E 10
2.65E C4	0.39187E-C2	0.96249E-C6	0.13464E-06	0.39196E-02	0.26521E-04	0.52149E 07	0.36980E 08	0.95836E 10
2.70E C4	0.40869E-C2	0.90585E-C6	0.12878E-06	0.40878E-02	0.27665E-04	0.53786E 07	0.39316E 08	0.98844E 10
2.75E C4	0.42551E-C2	0.85346E-C6	0.12328E-06	0.42599E-02	0.28836E-04	0.55442E 07	0.41752E 08	0.10189E 11
2.80E C4	0.44354E-C2	0.80509E-C6	0.11814E-06	0.44362E-02	0.30036E-04	0.57119E 07	0.44292E 08	0.10497E 11
2.85E C4	0.46157E-C2	0.76008E-C6	0.11327E-06	0.46165E-02	0.31263E-04	0.58816E 07	0.46939E 08	0.10809E 11
2.90E C4	0.48001E-C2	0.71844E-C6	0.10871E-06	0.48009E-02	0.32514E-04	0.60532E 07	0.49694E 08	0.11124E 11
2.95E C4	0.49887E-C2	0.67579E-C6	0.10442E-06	0.49894E-02	0.33802E-04	0.62268E 07	0.52561E 08	0.11443E 11
3.00E C4	0.51814E-C2	0.64377E-C6	0.10037E-06	0.51820E-02	0.35114E-04	0.64023E 07	0.55541E 08	0.11766E 11
3.05E C4	0.53783E-C2	0.61024E-C6	0.96538E-07	0.53789E-02	0.36455E-04	0.65798E 07	0.58637E 08	0.12092E 11
3.10E C4	0.55743E-C2	0.57936E-C6	0.92935E-07	0.55799E-02	0.37824E-04	0.67592E 07	0.61853E 08	0.12422E 11
3.15E C4	0.57846E-C2	0.54574E-C6	0.89494E-07	0.57851E-02	0.39222E-04	0.69405E 07	0.65189E 08	0.12755E 11
3.20E C4	0.59940E-C2	0.52237E-C6	0.86240E-07	0.59946E-02	0.40650E-04	0.71238E 07	0.68650E 08	0.13092E 11
3.25E C4	0.62178E-C2	0.49685E-C6	0.83170E-07	0.62083E-02	0.42106E-04	0.73089E 07	0.72238E 08	0.13432E 11
3.30E C4	0.64236E-C2	0.47250E-C6	0.80251E-07	0.64262E-02	0.43592E-04	0.74959E 07	0.75954E 08	0.13776E 11
3.35E C4	0.66341E-C2	0.45025E-C6	0.77452E-07	0.66485E-02	0.45107E-04	0.76848E 07	0.79803E 08	0.14123E 11
3.40E C4	0.68474E-C2	0.42927E-C6	0.74828E-07	0.68751E-02	0.46652E-04	0.78756E 07	0.83786E 08	0.14473E 11
3.45E C4	0.71056E-C2	0.40946E-C6	0.72319E-07	0.71060E-02	0.48264E-04	0.80682E 07	0.87906E 08	0.14827E 11
3.50E C4	0.73409E-C2	0.39077E-C6	0.69923E-07	0.73413E-02	0.49831E-04	0.82627E 07	0.92166E 08	0.15195E 11
3.55E C4	0.75805E-C2	0.37318E-C6	0.67637E-07	0.75809E-02	0.51465E-04	0.84590E 07	0.96569E 08	0.15545E 11
3.60E C4	0.78246E-C2	0.35661E-C6	0.65460E-07	0.78250E-02	0.53130E-04	0.86571E 07	0.10112E 09	0.15910E 11
3.65E C4	0.80737E-C2	0.34103E-C6	0.63389E-07	0.80734E-02	0.54825E-04	0.88571E 07	0.10581E 09	0.16277E 11
3.70E C4	0.83260E-C2	0.32624E-C6	0.61396E-07	0.83263E-02	0.56559E-04	0.90589E 07	0.11066E 09	0.16648E 11
3.75E C4	0.85833E-C2	0.31235E-C6	0.59507E-07	0.85836E-02	0.58306E-04	0.92625E 07	0.11566E 09	0.17022E 11
3.80E C4	0.88451E-C2	0.29918E-C6	0.57692E-07	0.88454E-02	0.60093E-04	0.94679E 07	0.12081E 09	0.17399E 11
3.85E C4	0.91115E-C2	0.28670E-C6	0.55950E-07	0.91118E-02	0.61910E-04	0.96751E 07	0.12613E 09	0.17780E 11
3.90E C4	0.93823E-C2	0.27487E-C6	0.54280E-07	0.93826E-02	0.63759E-04	0.98840E 07	0.13160E 09	0.18164E 11
3.95E C4	0.96576E-C2	0.26381E-C6	0.52709E-07	0.96579E-02	0.65639E-04	0.10095E 08	0.13725E 09	0.18552E 11
4.00E C4	0.99379E-C2	0.25320E-C6	0.51179E-07	0.99378E-02	0.67550E-04	0.10307E 08	0.14305E 09	0.18942E 11
4.05E C4	0.10222E-C1	0.24318E-C6	0.49718E-07	0.10222E-01	0.69492E-04	0.10522E 08	0.14903E 09	0.19336E 11

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(b) Continued. Pressure,  $10^{-4}$  atmosphere

Temperature, °K	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec			Shielded coulombic col- lision cross sections, $\bar{\sigma}_c^2$		Dimensionless parameters for shielded coulombic collisions		
T	$D_{H^+-H}$	$D_{e-H}$	$D_{e-H^+}$	$\bar{\sigma}_c(1,1)$	$\bar{\sigma}_c(2,2)$	$A_c^*$	$B_c^*$	$C_c^*$
5.00E 03	0.33746E C6	0.33930E 08	0.33933E 06	4561.88	4841.11	1.06121	1.04077	0.37414
5.50E 03	0.35327E C6	0.29974E C8	0.29820E 08	3500.09	3730.86	1.06593	1.04391	0.37729
6.00E 03	0.45178E C6	0.21647E C8	0.21361E 08	2756.62	2950.53	1.07034	1.04685	0.38023
6.50E 03	0.51358E C6	0.13641E C8	0.13226E 08	2220.18	2385.40	1.07442	1.04956	0.38295
7.00E 03	0.57954E C6	0.83790E C7	0.78567E 07	1824.06	1966.52	1.07810	1.05202	0.38540
7.50E 03	0.64565E C6	0.54054E C7	0.47897E 07	1526.94	1651.04	1.08128	1.05413	0.38752
8.00E 03	0.72320E C6	0.37959E C7	0.30940E 07	1302.48	1411.55	1.08374	1.05577	0.38916
8.50E 03	0.79962E C6	0.29658E C7	0.21808E 07	1133.13	1229.75	1.08527	1.05679	0.39018
9.00E 03	0.87876E C6	0.26173E C7	0.17499E 07	1005.53	1091.71	1.08571	1.05708	0.39047
9.50E 03	0.96042E C6	0.25840E C7	0.16338E 07	907.497	984.846	1.08523	1.05677	0.39016
1.00E 04	0.10452E C7	0.27465E C7	0.17119E 07	828.265	898.433	1.08425	1.05611	0.38950
1.05E 04	0.11326E C7	0.30233E C7	0.19023E 07	762.163	825.481	1.08308	1.05533	0.38872
1.10E 04	0.12226E C7	0.33714E C7	0.21616E 07	704.506	762.198	1.08189	1.05454	0.38793
1.15E 04	0.13154E C7	0.37715E C7	0.24704E 07	653.690	706.475	1.08075	1.05378	0.38717
1.20E 04	0.14108E C7	0.42162E C7	0.28213E 07	608.489	656.966	1.07967	1.05306	0.38645
1.25E 04	0.15069E C7	0.47029E C7	0.32118E 07	568.027	612.704	1.07865	1.05238	0.38577
1.30E 04	0.16055E C7	0.52316E C7	0.36418E 07	531.629	572.935	1.07770	1.05175	0.38513
1.35E 04	0.17127E C7	0.58031E C7	0.41123E 07	498.748	537.052	1.07680	1.05115	0.38453
1.40E 04	0.18184E C7	0.64188E C7	0.46245E 07	468.934	504.551	1.07595	1.05058	0.38397
1.45E 04	0.19267E C7	0.70804E C7	0.51803E 07	441.809	475.011	1.07515	1.05005	0.38343
1.50E 04	0.20374E C7	0.77896E C7	0.57815E 07	417.051	448.077	1.07439	1.04955	0.38293
1.55E 04	0.21505E C7	0.85485E C7	0.64299E 07	394.388	423.444	1.07367	1.04907	0.38245
1.60E 04	0.22660E C7	0.93589E C7	0.71277E 07	373.586	400.855	1.07299	1.04861	0.38199
1.65E 04	0.23840E C7	0.10223E C8	0.78768E 07	354.443	380.084	1.07234	1.04818	0.38156
1.70E 04	0.25042E C7	0.11142E C8	0.86792E 07	336.784	360.939	1.07172	1.04777	0.38115
1.75E 04	0.26269E C7	0.12119E C8	0.95371E 07	320.457	343.252	1.07113	1.04737	0.38075
1.80E 04	0.27518E C7	0.13156E C8	0.10453E C8	305.329	326.875	1.07057	1.04700	0.38038
1.85E 04	0.28751E C7	0.14255E C8	0.11428E C8	291.283	311.680	1.07002	1.04664	0.38002
1.90E 04	0.30086E C7	0.15417E C8	0.12465E C8	278.217	297.554	1.06950	1.04629	0.37967
1.95E 04	0.31403E C7	0.16646E C8	0.13566E C8	266.039	284.398	1.06901	1.04596	0.37934
2.00E 04	0.32744E C7	0.17943E C8	0.14733E C8	254.671	272.123	1.06853	1.04564	0.37902
2.05E 04	0.34106E C7	0.19310E C8	0.15969E C8	244.040	260.651	1.06807	1.04533	0.37871
2.10E 04	0.35400E C7	0.20750E C8	0.17275E C8	234.083	249.913	1.06762	1.04504	0.37842
2.15E 04	0.36846E C7	0.22265E C8	0.18654E C8	224.744	239.846	1.06720	1.04475	0.37813
2.20E 04	0.38324E C7	0.23857E C8	0.20109E C8	215.970	230.394	1.06678	1.04448	0.37786
2.25E 04	0.39773E C7	0.25528E C8	0.21641E C8	207.718	221.507	1.06638	1.04421	0.37759
2.30E 04	0.41243E C7	0.27281E C8	0.23252E C8	199.945	213.141	1.06600	1.04396	0.37733
2.35E 04	0.42735E C7	0.29118E C8	0.24946E C8	192.615	205.255	1.06563	1.04371	0.37708
2.40E 04	0.44248E C7	0.31041E C8	0.26725E C8	185.693	197.813	1.06527	1.04347	0.37684
2.45E 04	0.45781E C7	0.33053E C8	0.28590E C8	179.150	190.780	1.06492	1.04323	0.37661
2.50E 04	0.47336E C7	0.35155E C8	0.30544E C8	172.959	184.128	1.06458	1.04301	0.37639
2.55E 04	0.48910E C7	0.37351E C8	0.32590E C8	167.393	177.828	1.06425	1.04279	0.37617
2.60E 04	0.50506E C7	0.39643E C8	0.34729E C8	161.530	171.857	1.06393	1.04258	0.37595
2.65E 04	0.52121E C7	0.42033E C8	0.36966E C8	156.249	166.190	1.06362	1.04237	0.37575
2.70E 04	0.53757E C7	0.44523E C8	0.39301E C8	151.232	160.803	1.06332	1.04217	0.37555
2.75E 04	0.55413E C7	0.47116E C8	0.41737E C8	146.460	155.691	1.06303	1.04198	0.37535
2.80E 04	0.57089E C7	0.49814E C8	0.44277E C8	141.918	150.822	1.06274	1.04179	0.37516
2.85E 04	0.58785E C7	0.52620E C8	0.46923E C8	137.590	146.185	1.06246	1.04160	0.37498
2.90E 04	0.60500E C7	0.55537E C8	0.49678E C8	133.464	141.765	1.06219	1.04142	0.37480
2.95E 04	0.62235E C7	0.58566E C8	0.52544E C8	129.527	137.548	1.06193	1.04125	0.37462
3.00E 04	0.63990E C7	0.61710E C8	0.55524E C8	125.767	133.523	1.06167	1.04107	0.37445
3.05E 04	0.65764E C7	0.64972E C8	0.58620E C8	122.173	129.677	1.06142	1.04091	0.37428
3.10E 04	0.67557E C7	0.68355E C8	0.61835E C8	118.736	126.009	1.06118	1.04074	0.37412
3.15E 04	0.69369E C7	0.71860E C8	0.65172E C8	115.447	122.482	1.06094	1.04059	0.37396
3.20E 04	0.71200E C7	0.75490E C8	0.68632E C8	112.297	119.114	1.06071	1.04043	0.37380
3.25E 04	0.73051E C7	0.79249E C8	0.72219E C8	109.278	115.887	1.06048	1.04028	0.37365
3.30E 04	0.74920E C7	0.83138E C8	0.75936E C8	106.383	112.794	1.06026	1.04013	0.37350
3.35E 04	0.76808E C7	0.87160E C8	0.79784E C8	103.606	109.826	1.06004	1.03999	0.37336
3.40E 04	0.78715E C7	0.91317E C8	0.83767E C8	100.939	106.977	1.05983	1.03984	0.37322
3.45E 04	0.80640E C7	0.95613E C8	0.87886E C8	98.3765	104.241	1.05962	1.03971	0.37308
3.50E 04	0.82584E C7	0.10005E C9	0.92146E C8	95.9138	101.612	1.05941	1.03957	0.37294
3.55E 04	0.84540E C7	0.10463E C9	0.96548E C8	93.5453	99.0845	1.05921	1.03944	0.37281
3.60E 04	0.86526E C7	0.10936E C9	0.10110E C9	91.2662	96.6526	1.05902	1.03931	0.37268
3.65E 04	0.88525E C7	0.11423E C9	0.10579E C9	89.0720	94.3118	1.05883	1.03918	0.37255
3.70E 04	0.90542E C7	0.11926E C9	0.11064E C9	86.9584	92.0576	1.05864	1.03905	0.37243
3.75E 04	0.92577E C7	0.12444E C9	0.11564E C9	84.9215	89.8856	1.05846	1.03893	0.37230
3.80E 04	0.94630E C7	0.12978E C9	0.12079E C9	82.9576	87.7919	1.05827	1.03881	0.37218
3.85E 04	0.96711E C7	0.13528E C9	0.12610E C9	81.0631	85.7727	1.05810	1.03869	0.37207
3.90E 04	0.98809E C7	0.14094E C9	0.13158E C9	79.2347	83.8243	1.05792	1.03858	0.37195
3.95E 04	0.10005E C9	0.14677E C9	0.13722E C9	77.4695	81.9436	1.05775	1.03846	0.37184
4.00E 04	0.10302E C9	0.15276E C9	0.14303E C9	75.7644	80.1274	1.05759	1.03835	0.37172
4.05E 04	0.10516E C9	0.15892E C9	0.14901E C9	74.1167	78.3726	1.05742	1.03824	0.37161



TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(b) Concluded. Pressure,  $10^{-4}$  atmosphere

Temperature, °K	Pure gas thermal conductivity, cal/(cm)(sec)(°K)		Pure gas viscosity, g/(cm)(sec)		Binary mixture thermal conductivity parameter, cal (cm)(sec)(°K)	Viscosity parameter, g/(cm)(sec)	Electrical conductivity second approximation parameter	Electrical conductivity, mhos/m
T	$\lambda_{H^+}$	$\lambda_e$	$\eta_{H^+}$	$\eta_e$	$\lambda_{H^+-e}$	$\eta_{H^+-e}$	$\Delta_c$	$\sigma$
5.00E 03	0.28938E-05	0.12405E-03	0.39144E-06	0.91312E-08	0.87743E-04	0.12913E-07	0.17137E-01	72.2173
5.50E 03	0.35282E-05	0.16888E-03	0.53272E-06	0.12427E-07	0.11941E-03	0.17574E-07	0.11185	237.539
6.00E 03	0.52012E-05	0.22257E-03	0.70356E-06	0.16412E-07	0.15771E-03	0.23210E-07	0.24018	505.575
6.50E 03	0.66561E-05	0.28705E-03	0.90578E-06	0.21129E-07	0.20303E-03	0.29881E-07	0.31999	791.737
7.00E 03	0.84250E-05	0.36134E-03	0.11402E-05	0.26597E-07	0.25558E-03	0.37614E-07	0.35604	1045.69
7.50E 03	0.10352E-04	0.44545E-03	0.14057E-05	0.32791E-07	0.31510E-03	0.46374E-07	0.37081	1269.62
8.00E 03	0.12554E-04	0.53817E-03	0.16982E-05	0.39613E-07	0.38064E-03	0.56021E-07	0.37672	1473.59
8.50E 03	0.14853E-04	0.63674E-03	0.20092E-05	0.46868E-07	0.45037E-03	0.66282E-07	0.37929	1660.49
9.00E 03	0.17216E-04	0.73805E-03	0.23289E-05	0.54325E-07	0.52202E-03	0.76827E-07	0.38088	1828.84
9.50E 03	0.19607E-04	0.84055E-03	0.26523E-05	0.61870E-07	0.59452E-03	0.87497E-07	0.38236	1979.93
1.00E 04	0.22052E-04	0.94533E-03	0.29829E-05	0.69583E-07	0.66863E-03	0.98405E-07	0.38386	2119.95
1.05E 04	0.24553E-04	0.10543E-02	0.33267E-05	0.77602E-07	0.74569E-03	0.10975E-06	0.38533	2255.22
1.10E 04	0.27062E-04	0.11687E-02	0.36877E-05	0.86023E-07	0.82661E-03	0.12165E-06	0.38671	2389.36
1.15E 04	0.30073E-04	0.12892E-02	0.40680E-05	0.94894E-07	0.91185E-03	0.13420E-06	0.38801	2523.98
1.20E 04	0.33035E-04	0.14162E-02	0.44686E-05	0.10424E-06	0.10017E-02	0.14742E-06	0.38923	2659.73
1.25E 04	0.36152E-04	0.15498E-02	0.48903E-05	0.11467E-06	0.10962E-02	0.16133E-06	0.39037	2796.87
1.30E 04	0.39427E-04	0.16902E-02	0.53333E-05	0.12441E-06	0.11955E-02	0.17594E-06	0.39144	2935.49
1.35E 04	0.42862E-04	0.18375E-02	0.57980E-05	0.13525E-06	0.12996E-02	0.19127E-06	0.39244	3075.62
1.40E 04	0.46461E-04	0.19917E-02	0.62847E-05	0.14660E-06	0.14087E-02	0.20733E-06	0.39339	3217.24
1.45E 04	0.50223E-04	0.21530E-02	0.67937E-05	0.15848E-06	0.15228E-02	0.22412E-06	0.39429	3360.34
1.50E 04	0.54153E-04	0.23215E-02	0.73252E-05	0.17088E-06	0.16420E-02	0.24165E-06	0.39513	3504.91
1.55E 04	0.58250E-04	0.24971E-02	0.78795E-05	0.18380E-06	0.17662E-02	0.25994E-06	0.39594	3650.90
1.60E 04	0.62517E-04	0.26800E-02	0.84567E-05	0.19727E-06	0.18956E-02	0.27898E-06	0.39670	3798.31
1.65E 04	0.66956E-04	0.28703E-02	0.90571E-05	0.21127E-06	0.20302E-02	0.29879E-06	0.39743	3947.10
1.70E 04	0.71560E-04	0.30680E-02	0.96810E-05	0.22583E-06	0.21700E-02	0.31937E-06	0.39813	4097.24
1.75E 04	0.76344E-04	0.32732E-02	0.10328E-04	0.24093E-06	0.23151E-02	0.34073E-06	0.39879	4248.73
1.80E 04	0.81317E-04	0.34860E-02	0.11000E-04	0.25659E-06	0.24656E-02	0.36287E-06	0.39943	4401.53
1.85E 04	0.86458E-04	0.37063E-02	0.11695E-04	0.27281E-06	0.26215E-02	0.38581E-06	0.40004	4555.63
1.90E 04	0.91773E-04	0.39344E-02	0.12415E-04	0.28960E-06	0.27828E-02	0.40955E-06	0.40063	4711.00
1.95E 04	0.97279E-04	0.41702E-02	0.13159E-04	0.30696E-06	0.29496E-02	0.43410E-06	0.40119	4867.62
2.00E 04	0.10256E-03	0.44135E-02	0.13928E-04	0.32489E-06	0.31219E-02	0.45946E-06	0.40173	5025.47
2.05E 04	0.10838E-03	0.46654E-02	0.14721E-04	0.34340E-06	0.32998E-02	0.48564E-06	0.40225	5184.55
2.10E 04	0.11468E-03	0.49248E-02	0.15540E-04	0.36250E-06	0.34833E-02	0.51265E-06	0.40275	5344.82
2.15E 04	0.12112E-03	0.51923E-02	0.16384E-04	0.38218E-06	0.36725E-02	0.54049E-06	0.40323	5506.28
2.20E 04	0.12755E-03	0.54678E-02	0.17253E-04	0.40246E-06	0.38673E-02	0.56917E-06	0.40370	5668.90
2.25E 04	0.13410E-03	0.57514E-02	0.18148E-04	0.42334E-06	0.40679E-02	0.59869E-06	0.40415	5832.67
2.30E 04	0.14067E-03	0.60432E-02	0.19069E-04	0.44462E-06	0.42743E-02	0.62907E-06	0.40458	5997.58
2.35E 04	0.14737E-03	0.63432E-02	0.20016E-04	0.46690E-06	0.44865E-02	0.66032E-06	0.40501	6163.61
2.40E 04	0.15516E-03	0.66515E-02	0.20988E-04	0.48960E-06	0.47046E-02	0.69239E-06	0.40541	6330.75
2.45E 04	0.16255E-03	0.69682E-02	0.21988E-04	0.51290E-06	0.49286E-02	0.72535E-06	0.40581	6498.98
2.50E 04	0.17013E-03	0.72932E-02	0.23013E-04	0.53683E-06	0.51585E-02	0.75919E-06	0.40619	6668.29
2.55E 04	0.17751E-03	0.76267E-02	0.24066E-04	0.56138E-06	0.53944E-02	0.79391E-06	0.40657	6838.67
2.60E 04	0.18569E-03	0.79687E-02	0.25145E-04	0.58655E-06	0.56353E-02	0.82951E-06	0.40693	7010.11
2.65E 04	0.19466E-03	0.83193E-02	0.26251E-04	0.61236E-06	0.58842E-02	0.86600E-06	0.40728	7182.58
2.70E 04	0.20244E-03	0.86785E-02	0.27384E-04	0.63879E-06	0.61383E-02	0.90339E-06	0.40762	7356.09
2.75E 04	0.21122E-03	0.90463E-02	0.28545E-04	0.66587E-06	0.63984E-02	0.94164E-06	0.40796	7530.62
2.80E 04	0.21981E-03	0.94229E-02	0.29733E-04	0.69359E-06	0.66648E-02	0.98088E-06	0.40828	7706.17
2.85E 04	0.22880E-03	0.98082E-02	0.30949E-04	0.72195E-06	0.69373E-02	0.10210E-05	0.40859	7882.70
2.90E 04	0.23754E-03	0.10202E-01	0.32193E-04	0.75096E-06	0.72161E-02	0.10620E-05	0.40890	8060.23
2.95E 04	0.24739E-03	0.10605E-01	0.33464E-04	0.78062E-06	0.75011E-02	0.11040E-05	0.40920	8238.74
3.00E 04	0.25700E-03	0.11017E-01	0.34764E-04	0.81094E-06	0.77925E-02	0.11468E-05	0.40949	8418.22
3.05E 04	0.26642E-03	0.11438E-01	0.36092E-04	0.84192E-06	0.80902E-02	0.11907E-05	0.40978	8598.65
3.10E 04	0.27664E-03	0.11869E-01	0.37449E-04	0.87356E-06	0.83942E-02	0.12354E-05	0.41006	8780.04
3.15E 04	0.28738E-03	0.12307E-01	0.38834E-04	0.90587E-06	0.87047E-02	0.12811E-05	0.41033	8962.37
3.20E 04	0.29753E-03	0.12755E-01	0.40248E-04	0.93885E-06	0.90216E-02	0.13277E-05	0.41059	9145.63
3.25E 04	0.30820E-03	0.13212E-01	0.41690E-04	0.97251E-06	0.93450E-02	0.13753E-05	0.41085	9329.81
3.30E 04	0.31848E-03	0.13679E-01	0.43162E-04	0.10068E-05	0.96748E-02	0.14239E-05	0.41111	9514.91
3.35E 04	0.32917E-03	0.14154E-01	0.44663E-04	0.10418E-05	0.10011E-01	0.14734E-05	0.41136	9700.91
3.40E 04	0.34149E-03	0.14639E-01	0.46193E-04	0.10775E-05	0.10354E-01	0.15239E-05	0.41160	9887.82
3.45E 04	0.35302E-03	0.15133E-01	0.47753E-04	0.11139E-05	0.10704E-01	0.15753E-05	0.41184	10075.6
3.50E 04	0.36477E-03	0.15637E-01	0.49342E-04	0.11510E-05	0.11060E-01	0.16278E-05	0.41207	10264.3
3.55E 04	0.37673E-03	0.16150E-01	0.50961E-04	0.11888E-05	0.11423E-01	0.16812E-05	0.41230	10453.9
3.60E 04	0.38852E-03	0.16673E-01	0.52610E-04	0.12272E-05	0.11793E-01	0.17356E-05	0.41252	10644.3
3.65E 04	0.40133E-03	0.17205E-01	0.54289E-04	0.12664E-05	0.12169E-01	0.17909E-05	0.41274	10835.6
3.70E 04	0.41357E-03	0.17746E-01	0.55998E-04	0.13063E-05	0.12552E-01	0.18473E-05	0.41295	11027.7
3.75E 04	0.42683E-03	0.18298E-01	0.57737E-04	0.13468E-05	0.12942E-01	0.19047E-05	0.41316	11220.7
3.80E 04	0.43991E-03	0.18858E-01	0.59507E-04	0.13881E-05	0.13339E-01	0.19631E-05	0.41337	11414.5
3.85E 04	0.45322E-03	0.19427E-01	0.61307E-04	0.14301E-05	0.13742E-01	0.20225E-05	0.41357	11609.2
3.90E 04	0.46679E-03	0.20009E-01	0.63138E-04	0.14728E-05	0.14153E-01	0.20829E-05	0.41377	11804.7
3.95E 04	0.48052E-03	0.20599E-01	0.65000E-04	0.15162E-05	0.14570E-01	0.21443E-05	0.41396	12001.0
4.00E 04	0.49451E-03	0.21199E-01	0.66892E-04	0.15604E-05	0.14994E-01	0.22067E-05	0.41416	12198.2
4.05E 04	0.50873E-03	0.21809E-01	0.68816E-04	0.16053E-05	0.15425E-01	0.22722E-05	0.41434	12396.1

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(c) Pressure,  $10^{-3}$  atmosphere

Temperature, °K	Mole fractions		Binary diffusion coefficients, cm <sup>2</sup> /sec			Thermal diffusion coefficients, g/(cm)(sec)		
T	x <sub>H</sub>	x <sub>H<sup>+</sup></sub>	D <sub>H-H<sup>+</sup></sub>	D <sub>H<sup>+</sup>-e</sub>	D <sub>H-e</sub>	D <sub>H</sub> <sup>T</sup>	D <sub>H<sup>+</sup></sub> <sup>T</sup>	D <sub>e</sub> <sup>T</sup>
5.00E 03	0.99970	0.10793E-03	79494.0	11193.7	0.11297E 08	-0.33897E-08	0.33653E-08	0.24354E-10
5.50E 03	0.99888	0.50872E-03	89916.3	16925.1	0.12912E 08	-0.14123E-07	0.13568E-07	0.55452E-09
6.00E 03	0.99625	0.18742E-02	95514.5	24618.7	0.13707E 08	-0.62352E-07	0.59008E-07	0.33439E-08
6.50E 03	0.98866	0.56707E-02	95692.2	34657.5	0.13492E 08	-0.31937E-06	0.30932E-06	0.10052E-07
7.00E 03	0.97068	0.14662E-01	95299.9	47435.2	0.12860E 08	-0.12542E-05	0.12343E-05	0.19939E-07
7.50E 03	0.93357	0.33214E-01	0.10111E 06	63331.5	0.12499E 08	-0.33578E-05	0.33264E-05	0.31456E-07
8.00E 03	0.86615	0.66904E-01	0.11731E 06	82668.4	0.12642E 08	-0.63052E-05	0.62615E-05	0.43668E-07
8.50E 03	0.75877	0.12061	0.14403E 06	0.10564E 06	0.13235E 08	-0.88725E-05	0.88166E-05	0.55847E-07
9.00E 03	0.61083	0.19459	0.17763E 06	0.13224E 06	0.14174E 08	-0.99903E-05	0.99229E-05	0.67447E-07
9.50E 03	0.43983	0.28010	0.21307E 06	0.16217E 06	0.15381E 08	-0.93374E-05	0.92591E-05	0.78256E-07
1.00E 04	0.27937	0.36031	0.24673E 06	0.19497E 06	0.16812E 08	-0.73208E-05	0.72324E-05	0.88399E-07
1.05E 04	0.15515	0.42043	0.27747E 06	0.23033E 06	0.18438E 08	-0.48912E-05	0.47929E-05	0.98353E-07
1.10E 04	0.05017E-01	0.45745	0.30585E 06	0.26831E 06	0.20230E 08	-0.29156E-05	0.28069E-05	0.10867E-06
1.15E 04	0.44703E-01	0.47765	0.33299E 06	0.30932E 06	0.22159E 08	-0.16478E-05	0.15282E-05	0.11966E-06
1.20E 04	0.23912E-01	0.48804	0.35978E 06	0.35382E 06	0.24209E 08	-0.92614E-06	0.79476E-06	0.13138E-06
1.25E 04	0.13236E-01	0.49338	0.38677E 06	0.40221E 06	0.26372E 08	-0.53194E-06	0.38813E-06	0.14381E-06
1.30E 04	0.76363E-02	0.49618	0.41422E 06	0.45482E 06	0.28443E 08	-0.31635E-06	0.15942E-06	0.15692E-06
1.35E 04	0.46054E-02	0.49770	0.44229E 06	0.51192E 06	0.31022E 08	-0.19596E-06	0.25248E-07	0.17071E-06
1.40E 04	0.25120E-02	0.49854	0.47104E 06	0.57374E 06	0.33509E 08	-0.12677E-06	-0.58403E-07	0.18517E-06
1.45E 04	0.15265E-02	0.49904	0.50050E 06	0.64053E 06	0.36104E 08	-0.85729E-07	-0.11457E-06	0.20030E-06
1.50E 04	0.13340E-02	0.49933	0.53069E 06	0.71252E 06	0.38807E 08	-0.60607E-07	-0.15550E-06	0.21611E-06
1.55E 04	0.96561E-03	0.49952	0.56161E 06	0.78994E 06	0.41619E 08	-0.44741E-07	-0.18787E-06	0.23261E-06
1.60E 04	0.76846E-03	0.49964	0.59330E 06	0.87300E 06	0.44540E 08	-0.34411E-07	-0.21538E-06	0.24979E-06
1.65E 04	0.57175E-03	0.49971	0.62563E 06	0.96195E 06	0.47570E 08	-0.27485E-07	-0.24019E-06	0.26768E-06
1.70E 04	0.46417E-03	0.49977	0.65847E 06	0.10570E 07	0.50709E 08	-0.22703E-07	-0.26356E-06	0.28627E-06
1.75E 04	0.28824E-03	0.49981	0.69257E 06	0.11584E 07	0.53958E 08	-0.19307E-07	-0.28626E-06	0.30556E-06
1.80E 04	0.23201E-03	0.49983	0.72711E 06	0.12663E 07	0.57315E 08	-0.16828E-07	-0.30875E-06	0.32558E-06
1.85E 04	0.25167E-03	0.49985	0.76237E 06	0.13811E 07	0.60781E 08	-0.14967E-07	-0.33135E-06	0.34632E-06
1.90E 04	0.25987E-03	0.49987	0.79834E 06	0.15029E 07	0.64355E 08	-0.13535E-07	-0.35425E-06	0.36779E-06
1.95E 04	0.23478E-03	0.49988	0.83501E 06	0.16320E 07	0.68036E 08	-0.12404E-07	-0.37758E-06	0.38999E-06
2.00E 04	0.21450E-03	0.49989	0.87239E 06	0.17686E 07	0.71824E 08	-0.11490E-07	-0.40144E-06	0.41293E-06
2.05E 04	0.19776E-03	0.49990	0.91046E 06	0.19129E 07	0.75718E 08	-0.10734E-07	-0.42589E-06	0.43663E-06
2.10E 04	0.18367E-03	0.49991	0.94923E 06	0.20652E 07	0.79717E 08	-0.10097E-07	-0.45097E-06	0.46107E-06
2.15E 04	0.17162E-03	0.49991	0.98868E 06	0.22258E 07	0.83818E 08	-0.95514E-08	-0.47673E-06	0.48628E-06
2.20E 04	0.16115E-03	0.49992	0.10288E 07	0.23949E 07	0.88022E 08	-0.90750E-08	-0.50317E-06	0.51225E-06
2.25E 04	0.15193E-03	0.49992	0.10696E 07	0.25727E 07	0.92326E 08	-0.86530E-08	-0.53033E-06	0.53899E-06
2.30E 04	0.14312E-03	0.49993	0.11111E 07	0.27595E 07	0.96729E 08	-0.82753E-08	-0.55823E-06	0.56450E-06
2.35E 04	0.13637E-03	0.49993	0.11533E 07	0.29556E 07	0.10123E 09	-0.79340E-08	-0.58687E-06	0.59480E-06
2.40E 04	0.12970E-03	0.49994	0.11962E 07	0.31611E 07	0.10582E 09	-0.76216E-08	-0.61627E-06	0.62389E-06
2.45E 04	0.12363E-03	0.49994	0.12397E 07	0.33764E 07	0.11051E 09	-0.73346E-08	-0.64643E-06	0.65377E-06
2.50E 04	0.11806E-03	0.49994	0.12838E 07	0.36016E 07	0.11529E 09	-0.70679E-08	-0.67737E-06	0.68444E-06
2.55E 04	0.11253E-03	0.49994	0.13287E 07	0.38372E 07	0.12015E 09	-0.68195E-08	-0.70910E-06	0.71592E-06
2.60E 04	0.10817E-03	0.49995	0.13742E 07	0.40832E 07	0.12510E 09	-0.65863E-08	-0.74162E-06	0.74821E-06
2.65E 04	0.10370E-03	0.49995	0.14203E 07	0.43401E 07	0.13013E 09	-0.63668E-08	-0.77494E-06	0.78131E-06
2.70E 04	0.95643E-04	0.49995	0.14671E 07	0.46079E 07	0.13524E 09	-0.61595E-08	-0.80907E-06	0.81523E-06
2.75E 04	0.95794E-04	0.49995	0.15145E 07	0.48871E 07	0.14043E 09	-0.59627E-08	-0.84400E-06	0.84997E-06
2.80E 04	0.92180E-04	0.49995	0.15626E 07	0.51779E 07	0.14569E 09	-0.57750E-08	-0.87976E-06	0.88554E-06
2.85E 04	0.88789E-04	0.49996	0.16113E 07	0.54805E 07	0.15102E 09	-0.55967E-08	-0.91634E-06	0.92194E-06
2.90E 04	0.85603E-04	0.49996	0.16607E 07	0.57952E 07	0.15642E 09	-0.54256E-08	-0.95376E-06	0.95918E-06
2.95E 04	0.82553E-04	0.49996	0.17107E 07	0.61222E 07	0.16188E 09	-0.52617E-08	-0.99200E-06	0.99727E-06
3.00E 04	0.79740E-04	0.49996	0.17613E 07	0.64620E 07	0.16741E 09	-0.51042E-08	-0.10311E-05	0.10362E-05
3.05E 04	0.77049E-04	0.49996	0.18126E 07	0.68146E 07	0.17299E 09	-0.49524E-08	-0.10710E-05	0.10760E-05
3.10E 04	0.74456E-04	0.49996	0.18646E 07	0.71804E 07	0.17862E 09	-0.48063E-08	-0.11118E-05	0.11166E-05
3.15E 04	0.72075E-04	0.49996	0.19170E 07	0.75597E 07	0.18430E 09	-0.46652E-08	-0.11535E-05	0.11581E-05
3.20E 04	0.69772E-04	0.49997	0.19701E 07	0.79528E 07	0.19032E 09	-0.45288E-08	-0.11960E-05	0.12005E-05
3.25E 04	0.67581E-04	0.49997	0.20239E 07	0.83598E 07	0.19579E 09	-0.43965E-08	-0.12393E-05	0.12437E-05
3.30E 04	0.65502E-04	0.49997	0.20783E 07	0.87812E 07	0.20159E 09	-0.42689E-08	-0.12836E-05	0.12878E-05
3.35E 04	0.63513E-04	0.49997	0.21333E 07	0.92172E 07	0.20743E 09	-0.41444E-08	-0.13287E-05	0.13328E-05
3.40E 04	0.61613E-04	0.49997	0.21887E 07	0.96680E 07	0.21339E 09	-0.40233E-08	-0.13747E-05	0.13787E-05
3.45E 04	0.59813E-04	0.49997	0.22451E 07	0.10134E 08	0.21920E 09	-0.39065E-08	-0.14216E-05	0.14255E-05
3.50E 04	0.58084E-04	0.49997	0.23019E 07	0.10615E 08	0.22511E 09	-0.37920E-08	-0.14693E-05	0.14731E-05
3.55E 04	0.56430E-04	0.49997	0.23593E 07	0.11113E 08	0.23105E 09	-0.36804E-08	-0.15180E-05	0.15217E-05
3.60E 04	0.54843E-04	0.49997	0.24173E 07	0.11626E 08	0.23700E 09	-0.35712E-08	-0.15676E-05	0.15711E-05
3.65E 04	0.53330E-04	0.49997	0.24760E 07	0.12155E 08	0.24296E 09	-0.34651E-08	-0.16180E-05	0.16215E-05
3.70E 04	0.51877E-04	0.49997	0.25352E 07	0.12701E 08	0.24893E 09	-0.33611E-08	-0.16694E-05	0.16728E-05
3.75E 04	0.50484E-04	0.49997	0.25950E 07	0.13264E 08	0.25490E 09	-0.32594E-08	-0.17217E-05	0.17249E-05
3.80E 04	0.49143E-04	0.49998	0.26554E 07	0.13844E 08	0.26087E 09	-0.31595E-08	-0.17749E-05	0.17780E-05
3.85E 04	0.47861E-04	0.49998	0.27164E 07	0.14442E 08	0.26683E 09	-0.30622E-08	-0.18290E-05	0.18321E-05
3.90E 04	0.46664E-04	0.49998	0.27780E 07	0.15057E 08	0.27279E 09	-0.29662E-08	-0.18840E-05	0.18870E-05
3.95E 04	0.45439E-04	0.49998	0.28402E 07	0.15690E 08	0.27873E 09	-0.28723E-08	-0.19400E-05	0.19429E-05
4.00E 04	0.44262E-04	0.49998	0.29030E 07	0.16342E 08	0.28466E 09	-0.27796E-08	-0.19969E-05	0.19997E-05
4.05E 04	0.43157E-04	0.49998	0.29662E 07	0.17012E 08	0.29058E 09	-0.26890E-08	-0.20547E-05	0.20574E-05

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(c) Continued. Pressure,  $10^{-3}$  atmosphere

Temperature, °K	Thermal conductivity, cal/(cm)(sec)(°K)				Viscosity, g/(cm)(sec)	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec		
	Transla- tional	Reaction	Diffusional	Total		$D_{H-H^+}$	$D_{H^+-e}$	$D_{H-e}$
T	$\lambda_t$	$\lambda_r$	$\lambda_d$	$\lambda$	$\eta$	$D_{H-H^+}$	$D_{H^+-e}$	$D_{H-e}$
5.00E 03	0.41230E-C2	0.17426E-04	0.24458E-07	0.41405E-02	0.55584E-03	33787.3	0.58291E 08	0.76439E 07
5.50E 03	0.44186E-C2	0.72094E-C4	0.56286E-06	0.45907E-02	0.60482E-03	39436.7	0.59352E 08	0.17155E 08
6.00E 03	0.45695E-C2	0.23433E-C3	0.38972E-05	0.51438E-02	0.64990E-03	45372.3	0.52736E 08	0.34345E 08
6.50E 03	0.52257E-C2	0.63071E-C3	0.15349E-04	0.58604E-02	0.68259E-03	51583.3	0.40614E 08	0.57134E 08
7.00E 03	0.53243E-C2	0.14563E-02	0.44120E-04	0.67806E-02	0.68417E-03	58098.6	0.27892E 08	0.80989E 08
7.50E 03	0.50016E-C2	0.24489E-C2	0.10477E-03	0.79505E-02	0.63119E-03	64975.9	0.18061E 08	0.10278E 09
8.00E 03	0.42460E-C2	0.52892E-C2	0.21470E-03	0.95852E-02	0.51904E-03	72246.1	0.11500E 08	0.12224E 09
8.50E 03	0.34519E-C2	0.83831E-02	0.38112E-03	0.11835E-01	0.37695E-03	79879.3	0.73027E 07	0.14017E 09
9.00E 03	0.26364E-C2	0.11541E-C1	0.57784E-03	0.14178E-01	0.24527E-03	87823.8	0.46088E 07	0.15728E 09
9.50E 03	0.19344E-C2	0.13338E-01	0.72504E-03	0.15272E-01	0.14636E-03	96047.6	0.28692E 07	0.17402E 09
1.00E 04	0.14123E-C2	0.12412E-01	0.72259E-03	0.13824E-01	0.82305E-04	0.10454E 06	0.17693E 07	0.19067E 09
1.05E 04	0.10920E-C2	0.91802E-C2	0.56518E-03	0.10272E-01	0.45355E-04	0.11330E 06	0.11141E 07	0.20739E 09
1.10E 04	0.93664E-C3	0.56562E-02	0.36476E-03	0.65928E-02	0.25883E-04	0.12232E 06	0.75561E 06	0.22433E 09
1.15E 04	0.88763E-C3	0.31498E-C2	0.21150E-03	0.46374E-02	0.16200E-04	0.13160E 06	0.57754E 06	0.24159E 09
1.20E 04	0.89440E-C3	0.16989E-C2	0.11834E-03	0.25973E-02	0.11547E-04	0.14116E 06	0.50155E 06	0.25925E 09
1.25E 04	0.54155E-C3	0.92484E-C2	0.66664E-04	0.18664E-02	0.93995E-05	0.15057E 06	0.48221E 06	0.27734E 09
1.30E 04	0.10029E-C2	0.51869E-03	0.38619E-04	0.15216E-02	0.85113E-05	0.16104E 06	0.49529E 06	0.29589E 09
1.35E 04	0.10754E-C2	0.30257E-C3	0.23237E-C4	0.13780E-02	0.82799E-05	0.17136E 06	0.52823E 06	0.31488E 09
1.40E 04	0.11956E-C2	0.18438E-C3	0.14588E-04	0.13400E-02	0.84063E-05	0.18194E 06	0.57450E 06	0.33433E 09
1.45E 04	0.12417E-C2	0.11758E-C3	0.95750E-05	0.13593E-02	0.87396E-05	0.19277E 06	0.63069E 06	0.35424E 09
1.50E 04	0.13328E-C2	0.76498E-04	0.65728E-05	0.14113E-02	0.92008E-05	0.20384E 06	0.69500E 06	0.37460E 09
1.55E 04	0.14264E-C2	0.54808E-C4	0.47148E-05	0.14832E-02	0.97476E-05	0.21516E 06	0.76651E 06	0.39540E 09
1.60E 04	0.15283E-C2	0.39933E-C4	0.35264E-05	0.15683E-02	0.10356E-04	0.22672E 06	0.84478E 06	0.41665E 09
1.65E 04	0.16324E-C2	0.30261E-C4	0.27414E-05	0.16627E-02	0.11013E-04	0.23852E 06	0.92961E 06	0.43833E 09
1.70E 04	0.17405E-C2	0.23752E-C4	0.22058E-05	0.17643E-02	0.11711E-04	0.25056E 06	0.10210E 07	0.46045E 09
1.75E 04	0.18527E-C2	0.19221E-C4	0.18288E-05	0.18719E-02	0.12444E-04	0.26283E 06	0.11190E 07	0.48300E 09
1.80E 04	0.19689E-C2	0.15964E-04	0.15552E-05	0.19849E-02	0.13211E-04	0.27533E 06	0.12237E 07	0.50598E 09
1.85E 04	0.20852E-C2	0.13546E-C4	0.13507E-05	0.21028E-02	0.14008E-04	0.28806E 06	0.13354E 07	0.52937E 09
1.90E 04	0.22136E-C2	0.11936E-C4	0.11936E-05	0.22253E-02	0.14837E-04	0.30102E 06	0.14542E 07	0.55319E 09
1.95E 04	0.23460E-C2	0.10263E-04	0.10697E-05	0.23523E-02	0.15694E-04	0.31420E 06	0.15803E 07	0.57742E 09
2.00E 04	0.24746E-C2	0.91046E-05	0.96968E-06	0.24837E-02	0.16582E-04	0.32761E 06	0.17140E 07	0.60206E 09
2.05E 04	0.26113E-C2	0.81559E-05	0.88715E-06	0.26195E-02	0.17498E-04	0.34124E 06	0.18554E 07	0.62710E 09
2.10E 04	0.27522E-C2	0.73641E-C5	0.81776E-06	0.27595E-02	0.18444E-04	0.35509E 06	0.20049E 07	0.65256E 09
2.15E 04	0.28972E-C2	0.66936E-05	0.75851E-06	0.29039E-02	0.19418E-04	0.36916E 06	0.21626E 07	0.67841E 09
2.20E 04	0.30465E-C2	0.61174E-C5	0.70713E-06	0.30576E-02	0.20422E-04	0.38344E 06	0.23288E 07	0.70466E 09
2.25E 04	0.32091E-C2	0.56164E-05	0.66197E-06	0.32057E-02	0.21455E-04	0.39794E 06	0.25038E 07	0.73131E 09
2.30E 04	0.33579E-C2	0.51767E-C5	0.62193E-06	0.33630E-02	0.22518E-04	0.41265E 06	0.26877E 07	0.75834E 09
2.35E 04	0.35205E-C2	0.47880E-C5	0.58613E-06	0.35248E-02	0.23610E-04	0.42758E 06	0.28809E 07	0.78577E 09
2.40E 04	0.36864E-C2	0.44411E-05	0.55378E-06	0.36908E-02	0.24731E-04	0.44271E 06	0.30836E 07	0.81359E 09
2.45E 04	0.38572E-C2	0.41304E-C5	0.52444E-06	0.38613E-02	0.25883E-04	0.45806E 06	0.32961E 07	0.84178E 09
2.50E 04	0.40323E-C2	0.38501E-C5	0.49763E-06	0.40362E-02	0.27064E-04	0.47361E 06	0.35186E 07	0.87036E 09
2.55E 04	0.42119E-C2	0.35963E-C5	0.47304E-06	0.42155E-02	0.28276E-04	0.48936E 06	0.37515E 07	0.89932E 09
2.60E 04	0.43959E-C2	0.33654E-C5	0.45036E-06	0.43993E-02	0.29518E-04	0.50533E 06	0.39948E 07	0.92865E 09
2.65E 04	0.45844E-C2	0.31548E-C5	0.42938E-06	0.45875E-02	0.30791E-04	0.52149E 06	0.42490E 07	0.95836E 09
2.70E 04	0.47773E-C2	0.29621E-C5	0.40993E-06	0.47802E-02	0.32094E-04	0.53786E 06	0.45143E 07	0.98844E 09
2.75E 04	0.49747E-C2	0.27852E-C5	0.39181E-06	0.49775E-02	0.33428E-04	0.55442E 06	0.47910E 07	0.10189E 10
2.80E 04	0.51767E-C2	0.26222E-05	0.37488E-06	0.51793E-02	0.34793E-04	0.57119E 06	0.50792E 07	0.10497E 10
2.85E 04	0.53832E-C2	0.24720E-05	0.35908E-06	0.53857E-02	0.36189E-04	0.58816E 06	0.53794E 07	0.10809E 10
2.90E 04	0.55943E-C2	0.23334E-C5	0.34429E-06	0.55966E-02	0.37616E-04	0.60532E 06	0.56918E 07	0.11124E 10
2.95E 04	0.58103E-C2	0.22048E-C5	0.33038E-06	0.58122E-02	0.39075E-04	0.62268E 06	0.60166E 07	0.11443E 10
3.00E 04	0.60333E-C2	0.20856E-05	0.31730E-06	0.60324E-02	0.40566E-04	0.64023E 06	0.63542E 07	0.11766E 10
3.05E 04	0.62552E-C2	0.19747E-C5	0.30496E-06	0.62572E-02	0.42088E-04	0.65798E 06	0.67048E 07	0.12092E 10
3.10E 04	0.64649E-C2	0.18715E-C5	0.29334E-06	0.64867E-02	0.43642E-04	0.67592E 06	0.70687E 07	0.12422E 10
3.15E 04	0.67152E-C2	0.17759E-C5	0.28237E-06	0.67209E-02	0.45229E-04	0.69405E 06	0.74461E 07	0.12755E 10
3.20E 04	0.69562E-C2	0.16857E-C5	0.27198E-06	0.69599E-02	0.46847E-04	0.71238E 06	0.78375E 07	0.13092E 10
3.25E 04	0.72020E-C2	0.16019E-C5	0.26214E-06	0.72036E-02	0.48499E-04	0.73089E 06	0.82430E 07	0.13432E 10
3.30E 04	0.74565E-C2	0.15236E-C5	0.25285E-06	0.74520E-02	0.50182E-04	0.74959E 06	0.86629E 07	0.13775E 10
3.35E 04	0.77038E-C2	0.14501E-C5	0.24400E-06	0.77053E-02	0.51898E-04	0.76848E 06	0.90975E 07	0.14123E 10
3.40E 04	0.79619E-C2	0.13812E-C5	0.23558E-06	0.79633E-02	0.53648E-04	0.78756E 06	0.95472E 07	0.14473E 10
3.45E 04	0.82249E-C2	0.13168E-C5	0.22764E-06	0.82262E-02	0.55430E-04	0.80682E 06	0.10012E 08	0.14827E 10
3.50E 04	0.84927E-C2	0.12561E-C5	0.22005E-06	0.84939E-02	0.57245E-04	0.82627E 06	0.10493E 08	0.15185E 10
3.55E 04	0.87653E-C2	0.11990E-C5	0.21282E-06	0.87665E-02	0.59094E-04	0.84590E 06	0.10989E 08	0.15545E 10
3.60E 04	0.90429E-C2	0.11451E-C5	0.20591E-06	0.90440E-02	0.60976E-04	0.86571E 06	0.11502E 08	0.15909E 10
3.65E 04	0.93253E-C2	0.10946E-C5	0.19935E-06	0.93264E-02	0.62892E-04	0.88571E 06	0.12031E 08	0.16277E 10
3.70E 04	0.96127E-C2	0.10468E-C5	0.19308E-06	0.96138E-02	0.64842E-04	0.90589E 06	0.12577E 08	0.16648E 10
3.75E 04	0.99051E-C2	0.10017E-C5	0.18709E-06	0.99061E-02	0.66825E-04	0.92625E 06	0.13140E 08	0.17022E 10
3.80E 04	0.10212E-C1	0.95909E-C6	0.18135E-06	0.10203E-01	0.68843E-04	0.94679E 06	0.13721E 08	0.17399E 10
3.85E 04	0.10595E-C1	0.91890E-C6	0.17588E-06	0.10506E-01	0.70894E-04	0.96751E 06	0.14319E 08	0.17780E 10
3.90E 04	0.10812E-C1	0.88078E-C6	0.17063E-06	0.10813E-01	0.72980E-04	0.98840E 06	0.14935E 08	0.18164E 10
3.95E 04	0.11124E-C1	0.84478E-C6	0.16562E-06	0.11125E-01	0.75101E-04	0.10095E 07	0.15569E 08	0.18551E 10
4.00E 04	0.11442E-C1	0.81053E-C6	0.16079E-06	0.11443E-01	0.77256E-04	0.10307E 07	0.16222E 08	0.18942E 10
4.05E 04	0.11764E-C1	0.77822E-C6	0.15619E-06	0.11765E-01	0.79446E-04	0.10522E 07	0.16894E 08	0.19336E 10

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(c) Continued. Pressure,  $10^{-3}$  atmosphere

Temperature, °K	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec			Shielded coulombic col- lision cross sections, Å <sup>2</sup>		Dimensionless parameters for shielded coulombic collisions		
T	D <sub>H<sup>+</sup>-H</sub>	D <sub>e-H</sub>	D <sub>e-H<sup>+</sup></sub>	$\bar{\sigma}_c^{(1,1)}$	$\bar{\sigma}_c^{(2,2)}$	A <sub>c</sub> <sup>*</sup>	E <sub>c</sub> <sup>*</sup>	C <sub>c</sub> <sup>*</sup>
5.00E 03	33786.2	0.38448E 07	0.38427E 07	4240.34	4519.57	1.06585	1.04386	0.37723
5.50E 03	35432.8	0.40397E 07	0.40326E 07	3234.15	3464.92	1.07135	1.04752	0.38090
6.00E 03	45361.2	0.37155E 07	0.36989E 07	2532.58	2726.49	1.07657	1.05099	0.38438
6.50E 03	51567.3	0.29809E 07	0.29515E 07	2027.92	2193.14	1.08148	1.05426	0.38765
7.00E 03	58075.3	0.21531E 07	0.21104E 07	1655.46	1797.92	1.08606	1.05731	0.39071
7.50E 03	64540.1	0.14853E 07	0.14345E 07	1374.86	1498.96	1.09027	1.06012	0.39351
8.00E 03	72210.5	0.10394E 07	0.97385E 06	1160.14	1269.22	1.09407	1.06262	0.39601
8.50E 03	78638.3	0.75393E 06	0.67864E 06	994.161	1090.78	1.09719	1.06473	0.39812
9.00E 03	87777.8	0.57793E 06	0.49337E 06	865.251	951.433	1.09960	1.06634	0.39974
9.50E 03	95596.7	0.47433E 06	0.38076E 06	765.121	842.470	1.10109	1.06733	0.40073
1.00E 04	0.10448E 06	0.42151E 06	0.31901E 06	687.264	757.072	1.10157	1.06765	0.40105
1.05E 04	0.11324E 06	0.40593E 06	0.29448E 06	625.957	689.274	1.10115	1.06737	0.40077
1.10E 04	0.12225E 06	0.41702E 06	0.29653E 06	576.206	633.898	1.10012	1.06668	0.40008
1.15E 04	0.13153E 06	0.44619E 06	0.31649E 06	534.300	587.085	1.09879	1.06580	0.39920
1.20E 04	0.14108E 06	0.48750E 06	0.34839E 06	497.911	546.389	1.09736	1.06484	0.39824
1.25E 04	0.15089E 06	0.53751E 06	0.38878E 06	465.684	510.361	1.09594	1.06390	0.39729
1.30E 04	0.16095E 06	0.59443E 06	0.43585E 06	436.798	478.104	1.09457	1.06298	0.39638
1.35E 04	0.17127E 06	0.65741E 06	0.48875E 06	410.707	449.011	1.09326	1.06211	0.39551
1.40E 04	0.18184E 06	0.72609E 06	0.54711E 06	387.015	422.632	1.09203	1.06129	0.39469
1.45E 04	0.19267E 06	0.80037E 06	0.61084E 06	365.413	398.615	1.09086	1.06051	0.39391
1.50E 04	0.20374E 06	0.88029E 06	0.67999E 06	345.647	376.672	1.08976	1.05978	0.39317
1.55E 04	0.21509E 06	0.96594E 06	0.75468E 06	327.507	356.563	1.08872	1.05909	0.39248
1.60E 04	0.22669E 06	0.10576E 07	0.83507E 06	310.814	338.083	1.08773	1.05843	0.39182
1.65E 04	0.23840E 06	0.11553E 07	0.92135E 06	295.414	321.055	1.08680	1.05781	0.39120
1.70E 04	0.25042E 06	0.12594E 07	0.10137E 07	281.174	305.329	1.08591	1.05721	0.39061
1.75E 04	0.26269E 06	0.13699E 07	0.11124E 07	267.978	290.772	1.08506	1.05665	0.39004
1.80E 04	0.27518E 06	0.14873E 07	0.12177E 07	255.724	277.269	1.08425	1.05611	0.38950
1.85E 04	0.28751E 06	0.16116E 07	0.13297E 07	244.322	264.719	1.08348	1.05560	0.38899
1.90E 04	0.30086E 06	0.17431E 07	0.14488E 07	233.694	253.032	1.08275	1.05511	0.38850
1.95E 04	0.31404E 06	0.18821E 07	0.15751E 07	223.771	242.129	1.08204	1.05464	0.38803
2.00E 04	0.32744E 06	0.20288E 07	0.17088E 07	214.489	231.941	1.08137	1.05419	0.38758
2.05E 04	0.34106E 06	0.21834E 07	0.18504E 07	205.794	222.405	1.08072	1.05376	0.38714
2.10E 04	0.35490E 06	0.23462E 07	0.19998E 07	197.637	213.466	1.08009	1.05334	0.38673
2.15E 04	0.36896E 06	0.25174E 07	0.21576E 07	189.972	205.074	1.07949	1.05294	0.38633
2.20E 04	0.38324E 06	0.26973E 07	0.23238E 07	182.762	197.185	1.07892	1.05256	0.38595
2.25E 04	0.39773E 06	0.28861E 07	0.24987E 07	175.969	189.758	1.07836	1.05219	0.38557
2.30E 04	0.41244E 06	0.30840E 07	0.26826E 07	169.561	182.757	1.07783	1.05183	0.38522
2.35E 04	0.42735E 06	0.32914E 07	0.28758E 07	163.510	176.150	1.07731	1.05149	0.38487
2.40E 04	0.44248E 06	0.35085E 07	0.30785E 07	157.788	169.908	1.07681	1.05115	0.38454
2.45E 04	0.45781E 06	0.37355E 07	0.32909E 07	152.373	164.003	1.07632	1.05083	0.38422
2.50E 04	0.47336E 06	0.39727E 07	0.35134E 07	147.241	158.411	1.07586	1.05052	0.38390
2.55E 04	0.48911E 06	0.42203E 07	0.37461E 07	142.374	153.110	1.07540	1.05022	0.38360
2.60E 04	0.50506E 06	0.44787E 07	0.39894E 07	137.753	148.080	1.07496	1.04993	0.38331
2.65E 04	0.52122E 06	0.47461E 07	0.42435E 07	133.361	143.302	1.07454	1.04964	0.38303
2.70E 04	0.53757E 06	0.50287E 07	0.45087E 07	129.183	138.759	1.07413	1.04937	0.38275
2.75E 04	0.55413E 06	0.53208E 07	0.47853E 07	125.206	134.437	1.07372	1.04910	0.38248
2.80E 04	0.57089E 06	0.56247E 07	0.50735E 07	121.416	130.320	1.07334	1.04884	0.38222
2.85E 04	0.58785E 06	0.59407E 07	0.53736E 07	117.802	126.396	1.07296	1.04859	0.38197
2.90E 04	0.60500E 06	0.62690E 07	0.56859E 07	114.352	122.653	1.07259	1.04834	0.38173
2.95E 04	0.62235E 06	0.66099E 07	0.60106E 07	111.057	119.079	1.07223	1.04810	0.38149
3.00E 04	0.63990E 06	0.69630E 07	0.63481E 07	107.907	115.664	1.07188	1.04787	0.38125
3.05E 04	0.65764E 06	0.73306E 07	0.66986E 07	104.895	112.399	1.07154	1.04765	0.38103
3.10E 04	0.67557E 06	0.77109E 07	0.70623E 07	102.011	109.275	1.07121	1.04743	0.38081
3.15E 04	0.69369E 06	0.81050E 07	0.74397E 07	99.2481	106.283	1.07089	1.04721	0.38059
3.20E 04	0.71201E 06	0.85130E 07	0.78309E 07	96.6002	103.417	1.07057	1.04700	0.38038
3.25E 04	0.73051E 06	0.89353E 07	0.82363E 07	94.0606	100.670	1.07026	1.04680	0.38018
3.30E 04	0.74920E 06	0.93722E 07	0.86561E 07	91.6234	98.0336	1.06996	1.04660	0.37998
3.35E 04	0.76808E 06	0.98239E 07	0.90906E 07	89.2829	95.5033	1.06967	1.04640	0.37978
3.40E 04	0.78715E 06	0.10291E 08	0.95401E 07	87.0341	93.0728	1.06938	1.04621	0.37959
3.45E 04	0.80644E 06	0.10773E 08	0.10005E 08	84.8721	90.7371	1.06910	1.04602	0.37940
3.50E 04	0.82584E 06	0.11271E 08	0.10485E 08	82.7925	88.4911	1.06883	1.04584	0.37922
3.55E 04	0.84540E 06	0.11785E 08	0.10982E 08	80.7910	86.3302	1.06856	1.04566	0.37904
3.60E 04	0.86527E 06	0.12315E 08	0.11494E 08	78.8637	84.2502	1.06830	1.04549	0.37887
3.65E 04	0.88525E 06	0.12862E 08	0.12023E 08	77.0070	82.2468	1.06804	1.04532	0.37870
3.70E 04	0.90542E 06	0.13426E 08	0.12569E 08	75.2173	80.3165	1.06779	1.04515	0.37853
3.75E 04	0.92577E 06	0.14007E 08	0.13132E 08	73.4914	78.4555	1.06755	1.04499	0.37836
3.80E 04	0.94630E 06	0.14605E 08	0.13712E 08	71.8262	76.6606	1.06731	1.04483	0.37820
3.85E 04	0.96701E 06	0.15221E 08	0.14310E 08	70.2190	74.9286	1.06707	1.04467	0.37805
3.90E 04	0.98790E 06	0.15855E 08	0.14926E 08	68.6669	73.2565	1.06684	1.04451	0.37789
3.95E 04	0.10090E 07	0.16508E 08	0.15560E 08	67.1675	71.6417	1.06661	1.04436	0.37774
4.00E 04	0.10302E 07	0.17179E 08	0.16213E 08	65.7183	70.0813	1.06639	1.04422	0.37759
4.05E 04	0.10518E 07	0.17869E 08	0.16885E 08	64.3171	68.5731	1.06617	1.04407	0.37745

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(c) Concluded. Pressure,  $10^{-3}$  atmosphere

Temperature, °K	Pure gas thermal conductivity, cal/(cm)(sec)(°K)		Pure gas viscosity, g/(cm)(sec)		Binary mixture thermal con- ductivity parameter, cal (cm)(sec)(°K)	Viscosity parameter, g/(cm)(sec)	Electrical conductivity second ap- proximation parameter	Electrical conductivity, mhos/m
T	$\lambda_{H^+}$	$\lambda_e$	$\eta_{H^+}$	$\eta_e$	$\lambda_{H^+-e}$	$\eta_{H^+-e}$	$\Delta_c$	$\sigma$
5.00E 03	0.36997E-05	0.13288E-03	0.41929E-06	0.97808E-08	0.93985E-04	0.13832E-07	0.77371E-03	26.3995
5.50E 03	0.42405E-05	0.18178E-03	0.57361E-06	0.13381E-07	0.12358E-03	0.18923E-07	0.22082E-01	106.165
6.00E 03	0.56286E-05	0.24129E-03	0.76138E-06	0.17761E-07	0.17066E-03	0.25117E-07	0.98308E-01	290.624
6.50E 03	0.72831E-05	0.31222E-03	0.98518E-06	0.22981E-07	0.22083E-03	0.32501E-07	0.20152	578.656
7.00E 03	0.92194E-05	0.39523E-03	0.12471E-05	0.29091E-07	0.27954E-03	0.41141E-07	0.27856	908.171
7.50E 03	0.11446E-04	0.49065E-03	0.15483E-05	0.36118E-07	0.34707E-03	0.51079E-07	0.32151	1224.25
8.00E 03	0.13562E-04	0.59852E-03	0.18886E-05	0.44055E-07	0.42333E-03	0.62303E-07	0.34287	1512.65
8.50E 03	0.16746E-04	0.71786E-03	0.22652E-05	0.52839E-07	0.50774E-03	0.74726E-07	0.35307	1777.79
9.00E 03	0.19755E-04	0.84686E-03	0.26722E-05	0.62335E-07	0.59898E-03	0.88154E-07	0.35800	2024.30
9.50E 03	0.22921E-04	0.98260E-03	0.31005E-05	0.72326E-07	0.69499E-03	0.10273E-06	0.36065	2252.56
1.00E 04	0.26169E-04	0.11218E-02	0.35399E-05	0.82575E-07	0.79348E-03	0.11678E-06	0.36253	2460.87
1.05E 04	0.25453E-04	0.12626E-02	0.39841E-05	0.92937E-07	0.89305E-03	0.13143E-06	0.36429	2649.54
1.10E 04	0.32780E-04	0.14052E-02	0.44341E-05	0.10343E-06	0.99391E-03	0.14628E-06	0.36608	2823.27
1.15E 04	0.36185E-04	0.15514E-02	0.48953E-05	0.11419E-06	0.10973E-02	0.16149E-06	0.36787	2987.86
1.20E 04	0.39721E-04	0.17028E-02	0.53730E-05	0.12534E-06	0.12044E-02	0.17725E-06	0.36959	3148.19
1.25E 04	0.43401E-04	0.18666E-02	0.58709E-05	0.13695E-06	0.13160E-02	0.19368E-06	0.37123	3307.12
1.30E 04	0.47247E-04	0.20254E-02	0.63911E-05	0.14909E-06	0.14326E-02	0.21084E-06	0.37277	3466.13
1.35E 04	0.51267E-04	0.21978E-02	0.69349E-05	0.16177E-06	0.15545E-02	0.22878E-06	0.37422	3625.95
1.40E 04	0.55466E-04	0.23778E-02	0.75029E-05	0.17502E-06	0.16818E-02	0.24752E-06	0.37559	3786.93
1.45E 04	0.59849E-04	0.25657E-02	0.80958E-05	0.18885E-06	0.18147E-02	0.26707E-06	0.37687	3949.24
1.50E 04	0.64418E-04	0.27615E-02	0.87138E-05	0.20327E-06	0.19532E-02	0.28746E-06	0.37809	4112.95
1.55E 04	0.69176E-04	0.29655E-02	0.93574E-05	0.21828E-06	0.20975E-02	0.30870E-06	0.37923	4278.09
1.60E 04	0.74125E-04	0.31776E-02	0.10027E-04	0.23390E-06	0.22475E-02	0.33078E-06	0.38032	4444.66
1.65E 04	0.79266E-04	0.33981E-02	0.10722E-04	0.25012E-06	0.24034E-02	0.35372E-06	0.38135	4612.65
1.70E 04	0.84602E-04	0.36266E-02	0.11444E-04	0.26696E-06	0.25652E-02	0.37753E-06	0.38233	4782.05
1.75E 04	0.90135E-04	0.38640E-02	0.12193E-04	0.28441E-06	0.27330E-02	0.40222E-06	0.38327	4952.84
1.80E 04	0.95865E-04	0.41096E-02	0.12968E-04	0.30250E-06	0.29067E-02	0.42779E-06	0.38416	5125.01
1.85E 04	0.10180E-03	0.43638E-02	0.13770E-04	0.32121E-06	0.30865E-02	0.45426E-06	0.38501	5298.53
1.90E 04	0.10753E-03	0.46267E-02	0.14599E-04	0.34056E-06	0.32725E-02	0.48162E-06	0.38583	5473.38
1.95E 04	0.11426E-03	0.48982E-02	0.15466E-04	0.36054E-06	0.34645E-02	0.50988E-06	0.38661	5649.44
2.00E 04	0.12080E-03	0.51785E-02	0.16340E-04	0.38117E-06	0.36628E-02	0.53906E-06	0.38736	5827.00
2.05E 04	0.12754E-03	0.54676E-02	0.17253E-04	0.40246E-06	0.38673E-02	0.56916E-06	0.38808	6005.73
2.10E 04	0.13450E-03	0.57657E-02	0.18193E-04	0.42439E-06	0.40780E-02	0.60018E-06	0.38877	6185.77
2.15E 04	0.14160E-03	0.60726E-02	0.19162E-04	0.44699E-06	0.42952E-02	0.63213E-06	0.38944	6366.95
2.20E 04	0.14903E-03	0.63886E-02	0.20159E-04	0.47024E-06	0.45187E-02	0.66503E-06	0.39008	6549.41
2.25E 04	0.15661E-03	0.67137E-02	0.21185E-04	0.49417E-06	0.47486E-02	0.69886E-06	0.39070	6733.07
2.30E 04	0.16441E-03	0.70479E-02	0.22239E-04	0.51877E-06	0.49850E-02	0.73365E-06	0.39130	6917.92
2.35E 04	0.17242E-03	0.73913E-02	0.23323E-04	0.54405E-06	0.52278E-02	0.76940E-06	0.39188	7103.95
2.40E 04	0.18064E-03	0.77439E-02	0.24435E-04	0.57000E-06	0.54773E-02	0.80611E-06	0.39243	7291.14
2.45E 04	0.18909E-03	0.81059E-02	0.25578E-04	0.59665E-06	0.57333E-02	0.84379E-06	0.39297	7479.48
2.50E 04	0.19775E-03	0.84772E-02	0.26749E-04	0.62398E-06	0.59959E-02	0.88244E-06	0.39350	7668.96
2.55E 04	0.20663E-03	0.88580E-02	0.27951E-04	0.65201E-06	0.62653E-02	0.92203E-06	0.39400	7859.56
2.60E 04	0.21573E-03	0.92483E-02	0.29182E-04	0.68073E-06	0.65413E-02	0.96270E-06	0.39449	8051.26
2.65E 04	0.22506E-03	0.96481E-02	0.30444E-04	0.71016E-06	0.68241E-02	0.10043E-05	0.39497	8244.06
2.70E 04	0.23461E-03	0.10057E-01	0.31736E-04	0.74030E-06	0.71136E-02	0.10469E-05	0.39543	8437.94
2.75E 04	0.24438E-03	0.10477E-01	0.33058E-04	0.77114E-06	0.74109E-02	0.10906E-05	0.39588	8632.90
2.80E 04	0.25439E-03	0.10905E-01	0.34411E-04	0.80270E-06	0.77133E-02	0.11352E-05	0.39632	8828.91
2.85E 04	0.26462E-03	0.11344E-01	0.35795E-04	0.83498E-06	0.80234E-02	0.11808E-05	0.39674	9025.98
2.90E 04	0.27507E-03	0.11792E-01	0.37209E-04	0.86798E-06	0.83405E-02	0.12275E-05	0.39716	9224.08
2.95E 04	0.28576E-03	0.12250E-01	0.38655E-04	0.90170E-06	0.86646E-02	0.12752E-05	0.39756	9423.21
3.00E 04	0.29668E-03	0.12718E-01	0.40132E-04	0.93616E-06	0.89957E-02	0.13239E-05	0.39795	9623.36
3.05E 04	0.30783E-03	0.13196E-01	0.41641E-04	0.97135E-06	0.93338E-02	0.13737E-05	0.39833	9824.52
3.10E 04	0.31922E-03	0.13685E-01	0.43181E-04	0.10073E-05	0.96791E-02	0.14245E-05	0.39871	10026.7
3.15E 04	0.33084E-03	0.14183E-01	0.44753E-04	0.10439E-05	0.10031E-01	0.14764E-05	0.39907	10229.8
3.20E 04	0.34269E-03	0.14691E-01	0.46356E-04	0.10814E-05	0.10391E-01	0.15293E-05	0.39942	10433.9
3.25E 04	0.35479E-03	0.15209E-01	0.47992E-04	0.11195E-05	0.10758E-01	0.15832E-05	0.39977	10639.0
3.30E 04	0.36712E-03	0.15738E-01	0.49660E-04	0.11584E-05	0.11131E-01	0.16383E-05	0.40011	10845.1
3.35E 04	0.37969E-03	0.16277E-01	0.51361E-04	0.11981E-05	0.11513E-01	0.16944E-05	0.40044	11052.1
3.40E 04	0.39250E-03	0.16826E-01	0.53094E-04	0.12385E-05	0.11901E-01	0.17515E-05	0.40076	11260.1
3.45E 04	0.40556E-03	0.17386E-01	0.54860E-04	0.12797E-05	0.12297E-01	0.18098E-05	0.40108	11468.9
3.50E 04	0.41889E-03	0.17956E-01	0.56658E-04	0.13217E-05	0.12700E-01	0.18691E-05	0.40138	11678.8
3.55E 04	0.43252E-03	0.18536E-01	0.58490E-04	0.13644E-05	0.13111E-01	0.19295E-05	0.40169	11889.5
3.60E 04	0.44618E-03	0.19127E-01	0.60354E-04	0.14079E-05	0.13529E-01	0.19910E-05	0.40198	12101.2
3.65E 04	0.46021E-03	0.19729E-01	0.62252E-04	0.14522E-05	0.13954E-01	0.20537E-05	0.40227	12313.7
3.70E 04	0.47449E-03	0.20341E-01	0.64184E-04	0.14972E-05	0.14387E-01	0.21174E-05	0.40255	12527.2
3.75E 04	0.48901E-03	0.20963E-01	0.66148E-04	0.15430E-05	0.14827E-01	0.21822E-05	0.40283	12741.5
3.80E 04	0.50379E-03	0.21597E-01	0.68147E-04	0.15897E-05	0.15275E-01	0.22481E-05	0.40310	12956.8
3.85E 04	0.51881E-03	0.22241E-01	0.70180E-04	0.16371E-05	0.15731E-01	0.23152E-05	0.40337	13172.9
3.90E 04	0.53409E-03	0.22896E-01	0.72246E-04	0.16853E-05	0.16194E-01	0.23833E-05	0.40363	13389.9
3.95E 04	0.54952E-03	0.23561E-01	0.74347E-04	0.17343E-05	0.16665E-01	0.24526E-05	0.40389	13607.7
4.00E 04	0.56540E-03	0.24238E-01	0.76431E-04	0.17841E-05	0.17143E-01	0.25231E-05	0.40414	13826.4
4.05E 04	0.58143E-03	0.24925E-01	0.78651E-04	0.18347E-05	0.17630E-01	0.25946E-05	0.40439	14046.0

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(d) Pressure,  $10^{-2}$  atmosphere

Temperature, °K	Mole fractions		Binary diffusion coefficients, cm <sup>2</sup> /sec			Thermal diffusion coefficients, g/(cm)(sec)		
T	X <sub>H</sub>	X <sub>H<sup>+</sup></sub>	D <sub>H-H<sup>+</sup></sub>	D <sub>H<sup>+</sup>-e</sub>	D <sub>H-e</sub>	D <sub>H</sub> <sup>T</sup>	D <sub>H<sup>+</sup></sub> <sup>T</sup>	D <sub>e</sub> <sup>T</sup>
5.00E 03	0.99993	0.34133E-04	8036.52	1210.73	0.11441E 07	-0.11807E-08	0.11839E-08	-0.32684E-11
5.50E 03	0.99568	0.16124E-03	9339.79	1843.29	0.13502E 07	-0.53320E-08	0.52743E-08	0.57721E-10
6.00E 03	0.99881	0.59344E-03	10500.8	2699.01	0.15357E 07	-0.17841E-07	0.17174E-07	0.66755E-09
6.50E 03	0.99440	0.18003E-02	11339.0	3824.21	0.16632E 07	-0.58303E-07	0.55001E-07	0.33022E-08
7.00E 03	0.99063	0.46839E-02	11739.4	5268.09	0.17090E 07	-0.21716E-06	0.20748E-06	0.96879E-08
7.50E 03	0.98749	0.10753E-01	11895.0	7081.53	0.16920E 07	-0.74317E-06	0.72313E-06	0.20042E-07
8.00E 03	0.98550	0.22222E-01	12233.3	9314.89	0.16591E 07	-0.20038E-05	0.19706E-05	0.33207E-07
8.50E 03	0.91618	0.41912E-01	13187.6	12014.7	0.16479E 07	-0.41537E-05	0.41057E-05	0.63620E-07
9.00E 03	0.85444	0.72782E-01	15008.6	15218.5	0.16732E 07	-0.67736E-05	0.67100E-05	0.63620E-07
9.50E 03	0.76614	0.11693	17667.2	18948.4	0.17350E 07	-0.90585E-05	0.89790E-05	0.79465E-07
1.00E 04	0.65177	0.17411	20986.5	23203.1	0.18286E 07	-0.10358E-04	0.10263E-04	0.95133E-07
1.05E 04	0.51924	0.24038	24575.0	27954.1	0.19495E 07	-0.10419E-04	0.10309E-04	0.11042E-06
1.10E 04	0.38291	0.30804	28171.6	33149.1	0.20945E 07	-0.93464E-05	0.92212E-05	0.12529E-06
1.15E 04	0.26362	0.36815	31617.0	38732.0	0.22617E 07	-0.75322E-05	0.73924E-05	0.13985E-06
1.20E 04	0.17040	0.41480	34870.5	44671.2	0.24489E 07	-0.55263E-05	0.53720E-05	0.15439E-06
1.25E 04	0.10612	0.44694	37967.3	50976.6	0.26500E 07	-0.37838E-05	0.36146E-05	0.16922E-06
1.30E 04	0.65250E-01	0.46737	40970.4	57690.7	0.28746E 07	-0.24922E-05	0.23076E-05	0.18460E-06
1.35E 04	0.40274E-01	0.47981	43938.2	64867.5	0.31087E 07	-0.16219E-05	0.14212E-05	0.20064E-06
1.40E 04	0.25458E-01	0.48727	46912.9	72558.5	0.33552E 07	-0.10625E-05	0.84514E-06	0.21740E-06
1.45E 04	0.16409E-01	0.49177	49921.3	80807.8	0.36133E 07	-0.70881E-06	0.47391E-06	0.23490E-06
1.50E 04	0.10970E-01	0.49452	52979.5	89653.2	0.38828E 07	-0.48455E-06	0.23139E-06	0.25316E-06
1.55E 04	0.75367E-02	0.49623	56096.9	99128.1	0.41634E 07	-0.34058E-06	0.68401E-07	0.27218E-06
1.60E 04	0.53439E-02	0.49733	59278.8	0.10926E 06	0.44552E 07	-0.24652E-06	-0.45449E-07	0.29197E-06
1.65E 04	0.35057E-02	0.49805	62528.0	0.12069E 06	0.47579E 07	-0.18383E-06	-0.12871E-06	0.31254E-06
1.70E 04	0.25452E-02	0.49853	65846.4	0.13163E 06	0.50717E 07	-0.14116E-06	-0.19273E-06	0.33390E-06
1.75E 04	0.22507E-02	0.49885	69234.7	0.14391E 06	0.53964E 07	-0.11151E-06	-0.24454E-06	0.35605E-06
1.80E 04	0.18288E-02	0.49905	72693.2	0.15696E 06	0.57320E 07	-0.90461E-07	-0.28854E-06	0.37900E-06
1.85E 04	0.14575E-02	0.49925	76222.1	0.17082E 06	0.60786E 07	-0.75211E-07	-0.32755E-06	0.40276E-06
1.90E 04	0.12545E-02	0.49937	79821.2	0.18549E 06	0.64359E 07	-0.63935E-07	-0.36340E-06	0.42733E-06
1.95E 04	0.10726E-02	0.49946	83490.3	0.20102E 06	0.68040E 07	-0.55430E-07	-0.39730E-06	0.45273E-06
2.00E 04	0.93347E-03	0.49953	87229.1	0.21743E 06	0.71828E 07	-0.48891E-07	-0.43006E-06	0.47895E-06
2.05E 04	0.82499E-03	0.49959	91037.4	0.23475E 06	0.75722E 07	-0.43767E-07	-0.46224E-06	0.50601E-06
2.10E 04	0.73888E-03	0.49963	94914.7	0.25300E 06	0.79720E 07	-0.39679E-07	-0.49423E-06	0.53391E-06
2.15E 04	0.66505E-03	0.49967	98860.8	0.27221E 06	0.83822E 07	-0.36358E-07	-0.52630E-06	0.56266E-06
2.20E 04	0.61160E-03	0.49969	0.10288E 06	0.29242E 06	0.88025E 07	-0.33617E-07	-0.55864E-06	0.59226E-06
2.25E 04	0.56373E-03	0.49972	0.10696E 06	0.31364E 06	0.92329E 07	-0.31317E-07	-0.59140E-06	0.62271E-06
2.30E 04	0.52300E-03	0.49974	0.11111E 06	0.33590E 06	0.96732E 07	-0.29358E-07	-0.62468E-06	0.65404E-06
2.35E 04	0.48160E-03	0.49976	0.11533E 06	0.35925E 06	0.10123E 08	-0.27668E-07	-0.65856E-06	0.68623E-06
2.40E 04	0.44780E-03	0.49977	0.11961E 06	0.38369E 06	0.10583E 08	-0.26190E-07	-0.69311E-06	0.71930E-06
2.45E 04	0.42113E-03	0.49978	0.12396E 06	0.40927E 06	0.11051E 08	-0.24883E-07	-0.72837E-06	0.75326E-06
2.50E 04	0.40746E-03	0.49980	0.12838E 06	0.43601E 06	0.11529E 08	-0.23714E-07	-0.76439E-06	0.78810E-06
2.55E 04	0.38628E-03	0.49981	0.13286E 06	0.46394E 06	0.12015E 08	-0.22660E-07	-0.80117E-06	0.82383E-06
2.60E 04	0.36719E-03	0.49982	0.13741E 06	0.49308E 06	0.12510E 08	-0.21701E-07	-0.83876E-06	0.86046E-06
2.65E 04	0.34586E-03	0.49983	0.14202E 06	0.52348E 06	0.13013E 08	-0.20821E-07	-0.87718E-06	0.89800E-06
2.70E 04	0.33404E-03	0.49983	0.14670E 06	0.55515E 06	0.13525E 08	-0.20008E-07	-0.91643E-06	0.93644E-06
2.75E 04	0.31951E-03	0.49984	0.15145E 06	0.58813E 06	0.14043E 08	-0.19253E-07	-0.95655E-06	0.97580E-06
2.80E 04	0.30610E-03	0.49985	0.15626E 06	0.62245E 06	0.14570E 08	-0.18548E-07	-0.99753E-06	0.10161E-05
2.85E 04	0.29469E-03	0.49985	0.16113E 06	0.65814E 06	0.15103E 08	-0.17885E-07	-0.10394E-05	0.10573E-05
2.90E 04	0.28216E-03	0.49986	0.16607E 06	0.69522E 06	0.15643E 08	-0.17261E-07	-0.10822E-05	0.10994E-05
2.95E 04	0.27141E-03	0.49986	0.17107E 06	0.73373E 06	0.16189E 08	-0.16670E-07	-0.11258E-05	0.11425E-05
3.00E 04	0.26134E-03	0.49987	0.17613E 06	0.77370E 06	0.16741E 08	-0.16108E-07	-0.11704E-05	0.11865E-05
3.05E 04	0.25189E-03	0.49987	0.18126E 06	0.81516E 06	0.17299E 08	-0.15572E-07	-0.12159E-05	0.12315E-05
3.10E 04	0.24303E-03	0.49988	0.18645E 06	0.85814E 06	0.17862E 08	-0.15061E-07	-0.12623E-05	0.12774E-05
3.15E 04	0.23466E-03	0.49988	0.19170E 06	0.90267E 06	0.18430E 08	-0.14571E-07	-0.13096E-05	0.13242E-05
3.20E 04	0.22678E-03	0.49988	0.19701E 06	0.94878E 06	0.19093E 08	-0.14100E-07	-0.13579E-05	0.13720E-05
3.25E 04	0.21931E-03	0.49988	0.20239E 06	0.99650E 06	0.19579E 08	-0.13647E-07	-0.14072E-05	0.14208E-05
3.30E 04	0.21224E-03	0.49988	0.20782E 06	0.10459E 07	0.20160E 08	-0.13209E-07	-0.14574E-05	0.14706E-05
3.35E 04	0.20554E-03	0.49990	0.21332E 06	0.10969E 07	0.20744E 08	-0.12787E-07	-0.15085E-05	0.15213E-05
3.40E 04	0.19910E-03	0.49990	0.21888E 06	0.11497E 07	0.21331E 08	-0.12377E-07	-0.15606E-05	0.15730E-05
3.45E 04	0.19210E-03	0.49990	0.22450E 06	0.12042E 07	0.21920E 08	-0.11980E-07	-0.16137E-05	0.16257E-05
3.50E 04	0.18573E-03	0.49991	0.23019E 06	0.12604E 07	0.22512E 08	-0.11596E-07	-0.16678E-05	0.16794E-05
3.55E 04	0.18182E-03	0.49991	0.23593E 06	0.13185E 07	0.23105E 08	-0.11221E-07	-0.17228E-05	0.17340E-05
3.60E 04	0.17658E-03	0.49991	0.24173E 06	0.13784E 07	0.23703E 08	-0.10856E-07	-0.17788E-05	0.17897E-05
3.65E 04	0.17157E-03	0.49991	0.24759E 06	0.14401E 07	0.24296E 08	-0.10501E-07	-0.18358E-05	0.18463E-05
3.70E 04	0.16677E-03	0.49992	0.25352E 06	0.15038E 07	0.24893E 08	-0.10153E-07	-0.18939E-05	0.19040E-05
3.75E 04	0.16217E-03	0.49992	0.25950E 06	0.15694E 07	0.25490E 08	-0.98135E-08	-0.19529E-05	0.19627E-05
3.80E 04	0.15777E-03	0.49992	0.26554E 06	0.16370E 07	0.26087E 08	-0.94822E-08	-0.20129E-05	0.20224E-05
3.85E 04	0.15357E-03	0.49992	0.27164E 06	0.17065E 07	0.26684E 08	-0.91571E-08	-0.20739E-05	0.20831E-05
3.90E 04	0.14953E-03	0.49993	0.27760E 06	0.17781E 07	0.27279E 08	-0.88383E-08	-0.21367E-05	0.21448E-05
3.95E 04	0.14565E-03	0.49993	0.28402E 06	0.18518E 07	0.27874E 08	-0.85255E-08	-0.21990E-05	0.22076E-05
4.00E 04	0.14192E-03	0.49993	0.29029E 06	0.19275E 07	0.28467E 08	-0.82189E-08	-0.22631E-05	0.22714E-05
4.05E 04	0.13834E-03	0.49993	0.29663E 06	0.20054E 07	0.29058E 08	-0.79169E-08	-0.23283E-05	0.23362E-05

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(d) Continued. Pressure,  $10^{-2}$  atmosphere

Temperature, °K	Thermal conductivity, cal/(cm)(sec)(°K)				Viscosity, g/(cm)(sec)	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec		
	Transla- tional	Reaction	Diffusional	Total		D <sub>H-H<sup>+</sup></sub>	D <sub>H<sup>+</sup>-e</sub>	D <sub>H-e</sub>
T	$\lambda_t$	$\lambda_r$	$\lambda_d$	$\lambda$	$\eta$	D <sub>H-H<sup>+</sup></sub>	D <sub>H<sup>+</sup>-e</sub>	D <sub>H-e</sub>
5.00E 03	0.41156E-02	0.55154E-05	-0.31395E-08	0.41213E-02	0.55605E-03	3380.13	0.60916E 07	0.52216E 06
5.50E 03	0.45017E-02	0.22862E-04	0.51322E-07	0.45246E-02	0.60592E-03	3948.39	0.67781E 07	0.93912E 06
6.00E 03	0.49040E-02	0.74598E-04	0.58880E-06	0.49786E-02	0.65471E-03	4548.01	0.69989E 07	0.18497E 07
6.50E 03	0.53050E-02	0.20227E-03	0.31422E-05	0.55113E-02	0.70023E-03	5176.67	0.66002E 07	0.33904E 07
7.00E 03	0.56753E-02	0.47335E-03	0.10838E-04	0.61487E-02	0.73701E-03	5833.15	0.56659E 07	0.54774E 07
7.50E 03	0.59174E-02	0.58239E-03	0.28397E-04	0.68998E-02	0.75403E-03	6518.10	0.44724E 07	0.78526E 07
8.00E 03	0.59912E-02	0.18417E-02	0.62382E-04	0.77429E-02	0.73542E-03	7234.31	0.33308E 07	0.10233E 08
8.50E 03	0.55361E-02	0.31563E-02	0.12092E-03	0.86924E-02	0.66941E-03	7985.15	0.24076E 07	0.12471E 08
9.00E 03	0.46967E-02	0.49735E-02	0.21118E-03	0.98702E-02	0.56113E-03	8771.73	0.17209E 07	0.14554E 08
9.50E 03	0.41528E-02	0.33394E-02	0.33394E-03	0.11354E-01	0.43335E-03	9591.92	0.12247E 07	0.16522E 08
1.00E 04	0.34253E-02	0.95082E-02	0.47633E-03	0.12933E-01	0.31187E-03	10442.4	0.86749E 06	0.18417E 08
1.05E 04	0.27733E-02	0.11283E-01	0.60568E-03	0.14055E-01	0.21239E-03	11320.7	0.60971E 06	0.20272E 08
1.10E 04	0.22472E-02	0.11798E-01	0.67419E-03	0.14045E-01	0.13906E-03	12225.5	0.42519E 06	0.22108E 08
1.15E 04	0.18628E-02	0.10704E-01	0.64699E-03	0.12568E-01	0.89130E-04	13156.4	0.29656E 06	0.23940E 08
1.20E 04	0.15210E-02	0.84507E-02	0.53668E-03	0.10072E-01	0.57285E-04	14112.9	0.21084E 06	0.25781E 08
1.25E 04	0.14952E-02	0.55987E-02	0.39541E-03	0.74579E-02	0.38008E-04	15095.1	0.15681E 06	0.27641E 08
1.30E 04	0.12621E-02	0.39077E-02	0.26974E-03	0.53698E-02	0.26775E-04	16102.7	0.12480E 06	0.29527E 08
1.35E 04	0.14815E-02	0.24763E-02	0.17722E-03	0.39578E-02	0.20409E-04	17135.7	0.10732E 06	0.31447E 08
1.40E 04	0.15361E-02	0.15593E-02	0.11542E-03	0.30960E-02	0.16904E-04	18193.8	99185.0	0.33406E 08
1.45E 04	0.16150E-02	0.99280E-03	0.75863E-04	0.26078E-02	0.15077E-04	19276.7	97074.8	0.35405E 08
1.50E 04	0.17067E-02	0.64557E-03	0.50853E-04	0.23543E-02	0.14245E-04	20384.3	98952.1	0.37446E 08
1.55E 04	0.18135E-02	0.43107E-03	0.34963E-04	0.22446E-02	0.14017E-04	21516.2	0.10359E 06	0.39530E 08
1.60E 04	0.19228E-02	0.29377E-03	0.24725E-04	0.22331E-02	0.14170E-04	22672.3	0.11023E 06	0.41657E 08
1.65E 04	0.20470E-02	0.21003E-03	0.18007E-04	0.22571E-02	0.14569E-04	23852.2	0.11844E 06	0.43827E 08
1.70E 04	0.21734E-02	0.15341E-03	0.13506E-04	0.23268E-02	0.15138E-04	25055.8	0.12795E 06	0.46040E 08
1.75E 04	0.23053E-02	0.11539E-03	0.10424E-04	0.24207E-02	0.15826E-04	26282.7	0.13858E 06	0.48296E 08
1.80E 04	0.24425E-02	0.89243E-04	0.82658E-05	0.25317E-02	0.16604E-04	27532.8	0.15024E 06	0.50594E 08
1.85E 04	0.25847E-02	0.70318E-04	0.67213E-05	0.26555E-02	0.17454E-04	28805.9	0.16287E 06	0.52934E 08
1.90E 04	0.27319E-02	0.57528E-04	0.55914E-05	0.27894E-02	0.18362E-04	30101.8	0.17645E 06	0.55316E 08
1.95E 04	0.28839E-02	0.47717E-04	0.47469E-05	0.29316E-02	0.19321E-04	31420.2	0.19096E 06	0.57739E 08
2.00E 04	0.30408E-02	0.40314E-04	0.41024E-05	0.30811E-02	0.20326E-04	32761.0	0.20641E 06	0.60230E 08
2.05E 04	0.32025E-02	0.34607E-04	0.36007E-05	0.32371E-02	0.21372E-04	34124.0	0.22280E 06	0.62708E 08
2.10E 04	0.33690E-02	0.30119E-04	0.32025E-05	0.33991E-02	0.22458E-04	35508.9	0.24014E 06	0.65254E 08
2.15E 04	0.35404E-02	0.28807E-04	0.35669E-05	0.35669E-02	0.23581E-04	36915.7	0.25846E 06	0.67839E 08
2.20E 04	0.37166E-02	0.23592E-04	0.26163E-05	0.37402E-02	0.24741E-04	38344.2	0.27778E 06	0.70464E 08
2.25E 04	0.38976E-02	0.21666E-04	0.23955E-05	0.39188E-02	0.25937E-04	39794.1	0.29811E 06	0.73129E 08
2.30E 04	0.40836E-02	0.19128E-04	0.22085E-05	0.41027E-02	0.27169E-04	41265.4	0.31949E 06	0.75833E 08
2.35E 04	0.42744E-02	0.17394E-04	0.20481E-05	0.42918E-02	0.28435E-04	42757.8	0.34193E 06	0.78576E 08
2.40E 04	0.44702E-02	0.15903E-04	0.19089E-05	0.44861E-02	0.29736E-04	44271.3	0.36548E 06	0.81357E 08
2.45E 04	0.46710E-02	0.14667E-04	0.17688E-05	0.46856E-02	0.31072E-04	45805.6	0.39014E 06	0.84177E 08
2.50E 04	0.48767E-02	0.13471E-04	0.16789E-05	0.48901E-02	0.32443E-04	47360.7	0.41596E 06	0.87034E 08
2.55E 04	0.50874E-02	0.12467E-04	0.15820E-05	0.50999E-02	0.33848E-04	48936.4	0.44295E 06	0.89930E 08
2.60E 04	0.53032E-02	0.11573E-04	0.14951E-05	0.53147E-02	0.35289E-04	50532.5	0.47115E 06	0.92863E 08
2.65E 04	0.55240E-02	0.10773E-04	0.14165E-05	0.55347E-02	0.36764E-04	52149.0	0.50059E 06	0.95834E 08
2.70E 04	0.57458E-02	0.10053E-04	0.13448E-05	0.57599E-02	0.38274E-04	53785.7	0.53129E 06	0.98842E 08
2.75E 04	0.59686E-02	0.94021E-05	0.12793E-05	0.59902E-02	0.39819E-04	55442.5	0.56329E 06	0.10189E 09
2.80E 04	0.61918E-02	0.88104E-05	0.12190E-05	0.62258E-02	0.41399E-04	57119.2	0.59662E 06	0.10497E 09
2.85E 04	0.64168E-02	0.82709E-05	0.11633E-05	0.64665E-02	0.43015E-04	58815.7	0.63130E 06	0.10809E 09
2.90E 04	0.66434E-02	0.77775E-05	0.11118E-05	0.67124E-02	0.44666E-04	60532.0	0.66737E 06	0.11124E 09
2.95E 04	0.68763E-02	0.73248E-05	0.10639E-05	0.69636E-02	0.46352E-04	62267.9	0.70485E 06	0.11443E 09
3.00E 04	0.71132E-02	0.69079E-05	0.10192E-05	0.72201E-02	0.48075E-04	64023.3	0.74378E 06	0.11766E 09
3.05E 04	0.73532E-02	0.65232E-05	0.97749E-06	0.74818E-02	0.49833E-04	65798.1	0.78419E 06	0.12092E 09
3.10E 04	0.75972E-02	0.61678E-05	0.93844E-06	0.77489E-02	0.51627E-04	67592.1	0.82611E 06	0.12421E 09
3.15E 04	0.78459E-02	0.58383E-05	0.90174E-06	0.80213E-02	0.53458E-04	69405.3	0.86957E 06	0.12755E 09
3.20E 04	0.80939E-02	0.55325E-05	0.86726E-06	0.82990E-02	0.55325E-04	71237.7	0.91461E 06	0.13091E 09
3.25E 04	0.83481E-02	0.52481E-05	0.83477E-06	0.85821E-02	0.57228E-04	73088.9	0.96124E 06	0.13432E 09
3.30E 04	0.86053E-02	0.49828E-05	0.80408E-06	0.88705E-02	0.59168E-04	74959.1	0.10095E 07	0.13775E 09
3.35E 04	0.88659E-02	0.47356E-05	0.77512E-06	0.91644E-02	0.61145E-04	76848.0	0.10595E 07	0.14122E 09
3.40E 04	0.91295E-02	0.44944E-05	0.74768E-06	0.94637E-02	0.63159E-04	78755.7	0.11111E 07	0.14473E 09
3.45E 04	0.93964E-02	0.42881E-05	0.72168E-06	0.97685E-02	0.65210E-04	80681.9	0.11645E 07	0.14827E 09
3.50E 04	0.96679E-02	0.40857E-05	0.69706E-06	0.10079E-01	0.67298E-04	82626.6	0.12196E 07	0.15184E 09
3.55E 04	0.99439E-02	0.38556E-05	0.67304E-06	0.10394E-01	0.69423E-04	84589.8	0.12766E 07	0.15545E 09
3.60E 04	0.10217E-01	0.37171E-05	0.65138E-06	0.10716E-01	0.71586E-04	86571.2	0.13353E 07	0.15909E 09
3.65E 04	0.11059E-01	0.35494E-05	0.63021E-06	0.11042E-01	0.73787E-04	88571.0	0.13960E 07	0.16277E 09
3.70E 04	0.11709E-01	0.33916E-05	0.61004E-06	0.11375E-01	0.76026E-04	90588.8	0.14585E 07	0.16648E 09
3.75E 04	0.12369E-01	0.32426E-05	0.59077E-06	0.11713E-01	0.78302E-04	92624.8	0.15229E 07	0.17022E 09
3.80E 04	0.13033E-01	0.31026E-05	0.57245E-06	0.12056E-01	0.80617E-04	94678.7	0.15894E 07	0.17399E 09
3.85E 04	0.13707E-01	0.29732E-05	0.55491E-06	0.12405E-01	0.82970E-04	96750.6	0.16578E 07	0.17780E 09
3.90E 04	0.14381E-01	0.28451E-05	0.53814E-06	0.12760E-01	0.85361E-04	98840.3	0.17282E 07	0.18164E 09
3.95E 04	0.15055E-01	0.27269E-05	0.52212E-06	0.13121E-01	0.87792E-04	0.10095E 06	0.18007E 07	0.18551E 09
4.00E 04	0.15729E-01	0.26152E-05	0.50580E-06	0.13487E-01	0.90250E-04	0.10307E 06	0.18753E 07	0.18942E 09
4.05E 04	0.16403E-01	0.25053E-05	0.49213E-06	0.13858E-01	0.92768E-04	0.10522E 06	0.19521E 07	0.19336E 09

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(d) Continued. Pressure,  $10^{-2}$  atmosphere

Temperature, °K	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec			Shielded coulombic collision cross sections, $\bar{\Omega}_c^2$		Dimensionless parameters for shielded coulombic collisions		
T	D <sub>H<sup>+</sup>-H</sub>	D <sub>e-H</sub>	D <sub>e-H<sup>+</sup></sub>	$\bar{\Omega}_c^{(1,1)}$	$\bar{\Omega}_c^{(2,2)}$	A <sub>c</sub> <sup>*</sup>	E <sub>c</sub> <sup>*</sup>	C <sub>c</sub> <sup>*</sup>
5.00E 03	338C.10	0.40201E 06	0.40195E 06	3718.84	4198.07	1.07125	1.04745	0.38084
5.50E 03	344E.25	0.46133E 06	0.46107E 06	2968.39	3199.16	1.07774	1.05178	0.38516
6.00E 03	4547.61	0.49128E 06	0.49054E 06	2309.09	2503.00	1.08398	1.05593	0.38932
6.50E 03	5175.81	0.47875E 06	0.47717E 06	1837.05	2002.27	1.08994	1.05990	0.39329
7.00E 03	5831.86	0.42618E 06	0.42345E 06	1489.99	1632.45	1.09561	1.06368	0.39708
7.50E 03	6515.89	0.35058E 06	0.34652E 06	1229.06	1353.17	1.10097	1.06725	0.40065
8.00E 03	7231.38	0.27407E 06	0.26869E 06	1029.21	1138.29	1.10598	1.07058	0.40399
8.50E 03	7581.55	0.21029E 06	0.20368E 06	873.814	970.434	1.11057	1.07364	0.40705
9.00E 03	8767.51	0.1623CE 06	0.15454E 06	751.560	837.743	1.11467	1.07637	0.40978
9.50E 03	9587.11	0.12789E 06	0.11906E 06	654.588	731.937	1.11817	1.07870	0.41211
1.00E 04	10437.0	0.10386E 06	94003.9	577.295	647.103	1.12092	1.08053	0.41395
1.05E 04	11314.8	87586.8	76738.1	515.559	578.877	1.12281	1.08179	0.41521
1.10E 04	12219.1	71279.7	65449.0	466.182	523.875	1.12376	1.08242	0.41584
1.15E 04	13149.4	71737.7	58930.3	426.497	479.281	1.12376	1.08243	0.41584
1.20E 04	14105.4	70052.0	56266.1	394.170	442.648	1.12299	1.08191	0.41532
1.25E 04	15087.1	71410.0	56637.8	367.228	411.905	1.12166	1.08103	0.41444
1.30E 04	16094.2	75084.0	5313.0	344.157	385.463	1.12002	1.07993	0.41335
1.35E 04	17126.6	80495.3	63709.1	323.912	362.216	1.11825	1.07876	0.41217
1.40E 04	18184.1	87239.2	69419.0	305.821	341.437	1.11646	1.07756	0.41097
1.45E 04	19266.5	95058.8	76184.6	289.449	322.651	1.11471	1.07640	0.40981
1.50E 04	20373.4	0.10380E 06	83852.8	274.508	305.534	1.11302	1.07527	0.40868
1.55E 04	21504.8	0.11338E 06	92338.8	260.794	289.850	1.11142	1.07420	0.40761
1.60E 04	22660.2	0.12376E 06	0.10160E 06	248.152	275.420	1.10989	1.07318	0.40659
1.65E 04	23839.5	0.13492E 06	0.11162E 06	236.459	262.100	1.10844	1.07222	0.40563
1.70E 04	25042.4	0.14685E 06	0.12239E 06	225.615	249.770	1.10706	1.07130	0.40471
1.75E 04	26268.8	0.15957E 06	0.13393E 06	215.535	238.330	1.10576	1.07043	0.40384
1.80E 04	27518.2	0.17309E 06	0.14625E 06	206.145	227.691	1.10452	1.06961	0.40301
1.85E 04	28790.7	0.18743E 06	0.15937E 06	197.382	217.778	1.10334	1.06882	0.40222
1.90E 04	30085.6	0.20261E 06	0.17330E 06	189.188	208.525	1.10221	1.06807	0.40148
1.95E 04	31403.6	0.21865E 06	0.18808E 06	181.514	199.873	1.10114	1.06736	0.40076
2.00E 04	32743.7	0.23558E 06	0.20377E 06	174.317	191.769	1.10012	1.06668	0.40008
2.05E 04	34105.5	0.25342E 06	0.22027E 06	167.556	184.167	1.09914	1.06603	0.39942
2.10E 04	35490.2	0.27220E 06	0.23773E 06	161.197	177.026	1.09820	1.06540	0.39880
2.15E 04	36896.2	0.29194E 06	0.25613E 06	155.207	170.309	1.09730	1.06480	0.39820
2.20E 04	38323.5	0.31268E 06	0.27551E 06	149.558	163.981	1.09644	1.06423	0.39763
2.25E 04	39773.1	0.33444E 06	0.29589E 06	144.223	158.013	1.09561	1.06368	0.39707
2.30E 04	41243.6	0.35724E 06	0.31731E 06	139.181	152.377	1.09481	1.06315	0.39654
2.35E 04	42735.3	0.38112E 06	0.33977E 06	134.408	147.049	1.09405	1.06264	0.39603
2.40E 04	44248.0	0.40610E 06	0.36333E 06	129.886	142.006	1.09331	1.06214	0.39554
2.45E 04	45781.5	0.43222E 06	0.38800E 06	125.598	137.228	1.09260	1.06167	0.39506
2.50E 04	47335.8	0.45950E 06	0.41381E 06	121.526	132.695	1.09191	1.06121	0.39461
2.55E 04	48910.7	0.48796E 06	0.44080E 06	117.658	128.393	1.09124	1.06077	0.39416
2.60E 04	50506.0	0.51765E 06	0.46900E 06	113.978	124.304	1.09060	1.06034	0.39373
2.65E 04	52121.7	0.54858E 06	0.49842E 06	110.474	120.415	1.08998	1.05993	0.39332
2.70E 04	53757.6	0.58079E 06	0.52911E 06	107.136	116.712	1.08938	1.05953	0.39292
2.75E 04	55413.5	0.61432E 06	0.56109E 06	103.953	113.184	1.08880	1.05914	0.39253
2.80E 04	57089.4	0.64917E 06	0.59439E 06	100.916	109.820	1.08823	1.05876	0.39216
2.85E 04	58785.1	0.68540E 06	0.62905E 06	98.0141	106.608	1.08769	1.05840	0.39179
2.90E 04	60500.5	0.72302E 06	0.66509E 06	95.2408	103.541	1.08715	1.05804	0.39144
2.95E 04	62235.5	0.76208E 06	0.70254E 06	92.5880	100.610	1.08664	1.05770	0.39109
3.00E 04	63990.0	0.80259E 06	0.74144E 06	90.0489	97.8053	1.08614	1.05737	0.39076
3.05E 04	65763.9	0.84459E 06	0.78182E 06	87.6167	95.1209	1.08565	1.05704	0.39043
3.10E 04	67557.1	0.88811E 06	0.82370E 06	85.2456	92.5497	1.08517	1.05673	0.39012
3.15E 04	69369.4	0.93318E 06	0.86712E 06	83.0498	90.0851	1.08471	1.05642	0.38981
3.20E 04	71200.9	0.97984E 06	0.91212E 06	80.9042	87.7213	1.08426	1.05612	0.38951
3.25E 04	73051.2	0.10281E 07	0.95872E 06	78.8438	85.4528	1.08382	1.05583	0.38922
3.30E 04	74920.4	0.10780E 07	0.10069E 07	76.8641	83.2744	1.08340	1.05554	0.38893
3.35E 04	76808.4	0.11296E 07	0.10568E 07	74.9609	81.1812	1.08298	1.05527	0.38865
3.40E 04	78715.2	0.11829E 07	0.11084E 07	73.1302	79.1689	1.08258	1.05500	0.38838
3.45E 04	80640.4	0.12380E 07	0.11618E 07	71.3683	77.2333	1.08218	1.05473	0.38812
3.50E 04	82584.2	0.12948E 07	0.12169E 07	69.6717	75.3703	1.08179	1.05447	0.38786
3.55E 04	84540.4	0.13534E 07	0.12737E 07	68.0372	73.5764	1.08141	1.05422	0.38761
3.60E 04	86527.0	0.14139E 07	0.13325E 07	66.4617	71.8481	1.08105	1.05398	0.38736
3.65E 04	88545.7	0.14762E 07	0.13930E 07	64.9424	70.1822	1.08068	1.05374	0.38712
3.70E 04	90592.0	0.15404E 07	0.14555E 07	63.4765	68.5757	1.08033	1.05350	0.38689
3.75E 04	92677.5	0.16066E 07	0.15199E 07	62.0616	67.0257	1.07999	1.05327	0.38666
3.80E 04	94800.6	0.16747E 07	0.15863E 07	60.6953	65.5295	1.07965	1.05305	0.38643
3.85E 04	96961.5	0.17448E 07	0.16546E 07	59.3753	64.0848	1.07932	1.05283	0.38621
3.90E 04	99150.2	0.18170E 07	0.17250E 07	58.0994	62.6890	1.07900	1.05261	0.38600
3.95E 04	0.10050E 06	0.18912E 07	0.17975E 07	56.8658	61.3400	1.07868	1.05240	0.38579
4.00E 04	0.10302E 06	0.19676E 07	0.18720E 07	55.6726	60.0355	1.07837	1.05219	0.38558
4.05E 04	0.10510E 06	0.20460E 07	0.19487E 07	54.5179	58.7738	1.07806	1.05199	0.38538



TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(d) Concluded. Pressure,  $10^{-2}$  atmosphere

Temperature, °K	Pure gas thermal conductivity, cal/(cm)(sec)(°K)		Pure gas viscosity, g/(cm)(sec)		Binary mixture thermal con- ductivity parameter, cal (cm)(sec)(°K)	Viscosity parameter, g/(cm)(sec)	Electrical conductivity second ap- proximation parameter	Electrical conductivity, mhos/m
T	$\lambda_{H^+}$	$\lambda_e$	$\eta_{H^+}$	$\eta_e$	$\lambda_{H^+-e}$	$\eta_{H^+-e}$	$\Delta_c$	$\sigma$
5.00E C3	0.33377E-05	0.14366E-03	0.45140E-06	0.10530E-07	0.10118E-03	0.14891E-07	0.12463E-03	8.79700
5.50E C3	0.45927E-05	0.15685E-03	0.62126E-06	0.14492E-07	0.13926E-03	0.20495E-07	0.16359E-02	39.2863
6.00E C3	0.61311E-05	0.26284E-03	0.82936E-06	0.19346E-07	0.18590E-03	0.27360E-07	0.18549E-01	127.389
6.50E C3	0.79774E-05	0.34198E-03	0.10791E-05	0.25172E-07	0.24188E-03	0.35599E-07	0.69337E-01	311.873
7.00E C3	0.10154E-04	0.43525E-03	0.13735E-05	0.32040E-07	0.30788E-03	0.45312E-07	0.14567	603.067
7.50E C3	0.12660E-04	0.54356E-03	0.17152E-05	0.40010E-07	0.38446E-03	0.56582E-07	0.21696	966.929
8.00E C3	0.15566E-04	0.66736E-03	0.21058E-05	0.49122E-07	0.47202E-03	0.69469E-07	0.26713	1352.68
8.50E C3	0.18822E-04	0.80689E-03	0.25461E-05	0.59392E-07	0.57071E-03	0.83993E-07	0.29771	1727.89
9.00E C3	0.22436E-04	0.96179E-03	0.30349E-05	0.70794E-07	0.68027E-03	0.10012E-06	0.31515	2082.52
9.50E C3	0.26382E-04	0.11310E-02	0.35687E-05	0.83248E-07	0.79994E-03	0.11773E-06	0.32487	2416.83
1.00E C4	0.30616E-04	0.13125E-02	0.41415E-05	0.96608E-07	0.92832E-03	0.13662E-06	0.33036	2732.29
1.05E C4	0.33670E-04	0.15034E-02	0.47439E-05	0.11066E-06	0.10634E-02	0.15650E-06	0.33371	3028.56
1.10E C4	0.36644E-04	0.17003E-02	0.53653E-05	0.12516E-06	0.12027E-02	0.17700E-06	0.33613	3303.81
1.15E C4	0.44222E-04	0.19003E-02	0.59963E-05	0.13988E-06	0.13441E-02	0.19781E-06	0.33827	3556.72
1.20E C4	0.49030E-04	0.21018E-02	0.66322E-05	0.15471E-06	0.14866E-02	0.21879E-06	0.34042	3788.54
1.25E C4	0.53719E-04	0.23053E-02	0.72742E-05	0.16968E-06	0.16305E-02	0.23997E-06	0.34261	4003.31
1.30E C4	0.58602E-04	0.25122E-02	0.79271E-05	0.18492E-06	0.17769E-02	0.26151E-06	0.34481	4206.32
1.35E C4	0.63552E-04	0.27244E-02	0.85966E-05	0.20053E-06	0.19270E-02	0.28360E-06	0.34696	4402.28
1.40E C4	0.68656E-04	0.29432E-02	0.92871E-05	0.21664E-06	0.20817E-02	0.30638E-06	0.34902	4594.55
1.45E C4	0.73940E-04	0.31697E-02	0.10002E-04	0.23331E-06	0.22419E-02	0.32995E-06	0.35098	4785.25
1.50E C4	0.79417E-04	0.34045E-02	0.10743E-04	0.25059E-06	0.24080E-02	0.35439E-06	0.35283	4975.65
1.55E C4	0.85058E-04	0.36480E-02	0.11511E-04	0.26852E-06	0.25803E-02	0.37975E-06	0.35458	5166.49
1.60E C4	0.90907E-04	0.39036E-02	0.12308E-04	0.28711E-06	0.27589E-02	0.40604E-06	0.35624	5358.18
1.65E C4	0.97096E-04	0.41624E-02	0.13134E-04	0.30638E-06	0.29441E-02	0.43329E-06	0.35781	5550.96
1.70E C4	0.10342E-03	0.44336E-02	0.13990E-04	0.32634E-06	0.31358E-02	0.46151E-06	0.35929	5744.96
1.75E C4	0.10557E-03	0.47142E-02	0.14875E-04	0.34700E-06	0.33344E-02	0.49073E-06	0.36070	5940.26
1.80E C4	0.11674E-03	0.50045E-02	0.15791E-04	0.36836E-06	0.35397E-02	0.52094E-06	0.36204	6136.89
1.85E C4	0.12374E-03	0.53044E-02	0.16738E-04	0.39044E-06	0.37518E-02	0.55217E-06	0.36331	6334.86
1.90E C4	0.13056E-03	0.56142E-02	0.17715E-04	0.41324E-06	0.39709E-02	0.58441E-06	0.36453	6534.19
1.95E C4	0.13842E-03	0.59338E-02	0.18724E-04	0.43677E-06	0.41970E-02	0.61768E-06	0.36569	6734.87
2.00E C4	0.14610E-03	0.62633E-02	0.19764E-04	0.46102E-06	0.44300E-02	0.65198E-06	0.36680	6936.88
2.05E C4	0.15402E-03	0.66029E-02	0.20835E-04	0.48602E-06	0.46702E-02	0.68733E-06	0.36786	7140.21
2.10E C4	0.16218E-03	0.69525E-02	0.21938E-04	0.51175E-06	0.49175E-02	0.72372E-06	0.36888	7344.85
2.15E C4	0.17057E-03	0.73122E-02	0.23073E-04	0.53823E-06	0.51719E-02	0.76117E-06	0.36986	7550.79
2.20E C4	0.17920E-03	0.76822E-02	0.24241E-04	0.56546E-06	0.54336E-02	0.79969E-06	0.37079	7758.01
2.25E C4	0.18807E-03	0.80625E-02	0.25441E-04	0.59345E-06	0.57026E-02	0.83927E-06	0.37170	7966.48
2.30E C4	0.19710E-03	0.84530E-02	0.26673E-04	0.62220E-06	0.59784E-02	0.87993E-06	0.37256	8176.21
2.35E C4	0.20654E-03	0.88540E-02	0.27938E-04	0.65172E-06	0.62625E-02	0.92167E-06	0.37340	8387.17
2.40E C4	0.21614E-03	0.92655E-02	0.29237E-04	0.68200E-06	0.65535E-02	0.96450E-06	0.37421	8599.34
2.45E C4	0.22596E-03	0.96875E-02	0.30568E-04	0.71306E-06	0.68519E-02	0.10084E-05	0.37499	8812.72
2.50E C4	0.23607E-03	0.10120E-01	0.31933E-04	0.74490E-06	0.71579E-02	0.10534E-05	0.37574	9027.29
2.55E C4	0.24641E-03	0.10563E-01	0.33332E-04	0.77752E-06	0.74714E-02	0.10996E-05	0.37647	9243.04
2.60E C4	0.25700E-03	0.11017E-01	0.34764E-04	0.81094E-06	0.77928E-02	0.11468E-05	0.37717	9459.94
2.65E C4	0.26794E-03	0.11482E-01	0.36230E-04	0.84514E-06	0.81211E-02	0.11952E-05	0.37785	9678.00
2.70E C4	0.27933E-03	0.11957E-01	0.37731E-04	0.88014E-06	0.84574E-02	0.12447E-05	0.37851	9897.19
2.75E C4	0.29027E-03	0.12444E-01	0.39265E-04	0.91594E-06	0.88014E-02	0.12953E-05	0.37915	10117.5
2.80E C4	0.30167E-03	0.12941E-01	0.40834E-04	0.95254E-06	0.91531E-02	0.13471E-05	0.37977	10338.9
2.85E C4	0.31373E-03	0.13449E-01	0.42438E-04	0.98996E-06	0.95127E-02	0.14000E-05	0.38037	10561.5
2.90E C4	0.32689E-03	0.13969E-01	0.44077E-04	0.10282E-05	0.98800E-02	0.14541E-05	0.38096	10785.1
2.95E C4	0.33982E-03	0.14499E-01	0.45751E-04	0.10672E-05	0.10255E-01	0.15093E-05	0.38153	11009.8
3.00E C4	0.35089E-03	0.15041E-01	0.47460E-04	0.11071E-05	0.10638E-01	0.15657E-05	0.38208	11235.6
3.05E C4	0.36375E-03	0.15593E-01	0.49204E-04	0.11478E-05	0.11029E-01	0.16232E-05	0.38262	11462.4
3.10E C4	0.37651E-03	0.16158E-01	0.50984E-04	0.11893E-05	0.11428E-01	0.16819E-05	0.38314	11690.2
3.15E C4	0.38933E-03	0.16733E-01	0.52800E-04	0.12317E-05	0.11835E-01	0.17418E-05	0.38365	11919.2
3.20E C4	0.40401E-03	0.17320E-01	0.54651E-04	0.12748E-05	0.12250E-01	0.18029E-05	0.38415	12149.1
3.25E C4	0.41797E-03	0.17918E-01	0.56538E-04	0.13189E-05	0.12673E-01	0.18652E-05	0.38463	12380.0
3.30E C4	0.43219E-03	0.18527E-01	0.58462E-04	0.13637E-05	0.13104E-01	0.19286E-05	0.38510	12612.0
3.35E C4	0.44668E-03	0.19149E-01	0.60422E-04	0.14095E-05	0.13544E-01	0.19933E-05	0.38556	12845.0
3.40E C4	0.46144E-03	0.19781E-01	0.62418E-04	0.14560E-05	0.13991E-01	0.20591E-05	0.38601	13078.9
3.45E C4	0.47647E-03	0.20426E-01	0.64451E-04	0.15035E-05	0.14447E-01	0.21262E-05	0.38645	13313.9
3.50E C4	0.49177E-03	0.21082E-01	0.66521E-04	0.15517E-05	0.14911E-01	0.21945E-05	0.38688	13549.8
3.55E C4	0.50734E-03	0.21749E-01	0.68628E-04	0.16009E-05	0.15383E-01	0.22640E-05	0.38730	13786.6
3.60E C4	0.52314E-03	0.22429E-01	0.70772E-04	0.16509E-05	0.15864E-01	0.23347E-05	0.38771	14024.5
3.65E C4	0.53932E-03	0.23120E-01	0.72954E-04	0.17018E-05	0.16353E-01	0.24067E-05	0.38811	14263.3
3.70E C4	0.55576E-03	0.23823E-01	0.75172E-04	0.17535E-05	0.16850E-01	0.24799E-05	0.38850	14503.0
3.75E C4	0.57240E-03	0.24538E-01	0.77429E-04	0.18062E-05	0.17356E-01	0.25543E-05	0.38889	14743.7
3.80E C4	0.58936E-03	0.25265E-01	0.79723E-04	0.18597E-05	0.17870E-01	0.26300E-05	0.38926	14985.2
3.85E C4	0.60660E-03	0.26004E-01	0.82055E-04	0.19141E-05	0.18393E-01	0.27069E-05	0.38963	15227.8
3.90E C4	0.62412E-03	0.26755E-01	0.84424E-04	0.19694E-05	0.18924E-01	0.27851E-05	0.38999	15471.5
3.95E C4	0.64192E-03	0.27511E-01	0.86833E-04	0.20255E-05	0.19464E-01	0.28645E-05	0.39034	15715.5
4.00E C4	0.66001E-03	0.28294E-01	0.89279E-04	0.20826E-05	0.20012E-01	0.29452E-05	0.39069	15960.8
4.05E C4	0.67833E-03	0.29081E-01	0.91764E-04	0.21406E-05	0.20569E-01	0.30272E-05	0.39102	16206.9

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(e) Pressure,  $10^{-1}$  atmosphere

Temperature, °K	Mole fractions		Binary diffusion coefficients, $\text{cm}^2/\text{sec}$			Thermal diffusion coefficients, $\text{g}/(\text{cm})(\text{sec})$		
T	$x_{\text{H}}$	$x_{\text{H}^+}$	$\mathcal{D}_{\text{H-H}^+}$	$\mathcal{D}_{\text{H}^+-\text{e}}$	$\mathcal{D}_{\text{H-e}}$	$D_{\text{H}}^T$	$D_{\text{H}^+}^T$	$D_{\text{e}}^T$
5.00E 03	0.99998	C.10794E-04	806.280	131.839	0.11485E 06	-0.38578E-09	0.38801E-09	-0.22286E-11
5.50E 03	0.99990	0.50995E-04	945.120	202.365	0.13692E 06	-0.18658E-08	0.18662E-08	-0.39246E-12
6.00E 03	0.99962	0.18174E-03	1086.20	298.674	0.15976E 06	-0.66992E-08	0.66260E-08	0.73239E-10
6.50E 03	0.99966	0.56999E-03	1220.72	426.475	0.18176E 06	-0.19057E-07	0.18476E-07	0.58053E-09
7.00E 03	0.99763	0.14860E-02	1336.49	591.964	0.20058E 06	-0.48937E-07	0.46394E-07	0.25433E-08
7.50E 03	0.99315	0.34257E-02	1425.11	801.739	0.21407E 06	-0.13141E-06	0.12390E-06	0.75081E-08
8.00E 03	0.98573	0.71372E-02	1485.90	1062.68	0.22154E 06	-0.36645E-06	0.34798E-06	0.16586E-07
8.50E 03	0.97269	0.13656E-01	1534.45	1381.76	0.22436E 06	-0.93151E-06	0.90177E-06	0.29743E-07
9.00E 03	0.95143	0.24287E-01	1597.06	1765.78	0.22511E 06	-0.20442E-05	0.19981E-05	0.46133E-07
9.50E 03	0.91900	0.40500E-01	1701.68	2220.97	0.22620E 06	-0.37848E-05	0.37200E-05	0.64779E-07
1.00E 04	0.87257	0.63716E-01	1868.54	2752.48	0.22913E 06	-0.59554E-05	0.58705E-05	0.84894E-07
1.05E 04	0.81905	0.94976E-01	2104.28	3363.80	0.23458E 06	-0.81238E-05	0.80179E-05	0.10589E-06
1.10E 04	0.75069	C.13450	2401.33	4096.02	0.24267E 06	-0.98438E-05	0.97165E-05	0.12733E-06
1.15E 04	0.67445	C.18128	2742.37	4827.37	0.25334E 06	-0.10830E-04	0.10681E-04	0.14895E-06
1.20E 04	0.58439	0.23281	3107.37	5673.07	0.26646E 06	-0.10987E-04	0.10817E-04	0.17057E-06
1.25E 04	0.48930	0.28535	3479.32	6585.99	0.28192E 06	-0.10377E-04	0.10185E-04	0.19212E-06
1.30E 04	0.38053	0.33473	3846.99	7558.92	0.29967E 06	-0.91793E-05	0.89657E-05	0.21358E-06
1.35E 04	0.26002	0.37749	4204.98	8583.90	0.31962E 06	-0.76522E-05	0.74172E-05	0.23502E-06
1.40E 04	0.17641	0.41175	4552.48	9660.25	0.34165E 06	-0.60679E-05	0.58113E-05	0.25660E-06
1.45E 04	0.12473	0.43763	4891.51	10789.0	0.36560E 06	-0.46348E-05	0.43563E-05	0.27849E-06
1.50E 04	0.07587E-01	0.45621	5225.23	11975.0	0.39127E 06	-0.34582E-05	0.31573E-05	0.30086E-06
1.55E 04	0.01609E-01	0.46917	5556.86	13224.5	0.41848E 06	-0.25533E-05	0.22294E-05	0.32383E-06
1.60E 04	0.03824E-01	0.47805	5889.08	14544.1	0.44707E 06	-0.18848E-05	0.15373E-05	0.34751E-06
1.65E 04	0.21506E-01	0.48420	6223.90	15939.7	0.47696E 06	-0.14015E-05	0.10296E-05	0.37196E-06
1.70E 04	0.23178E-01	0.48841	6562.75	17416.9	0.50836E 06	-0.10550E-05	0.65781E-06	0.39722E-06
1.75E 04	0.17327E-01	0.49134	6906.59	18980.2	0.54035E 06	-0.80649E-06	0.38317E-06	0.42332E-06
1.80E 04	0.13212E-01	0.49335	7256.08	20634.0	0.57378E 06	-0.62714E-06	0.17685E-06	0.45029E-06
1.85E 04	0.10277E-01	0.49486	7611.62	22382.1	0.60833E 06	-0.49651E-06	0.18369E-07	0.47814E-06
1.90E 04	0.08123E-02	0.49592	7973.51	24228.4	0.64399E 06	-0.40027E-06	-0.10662E-06	0.50689E-06
1.95E 04	0.05511E-02	0.49670	8341.90	26176.2	0.68075E 06	-0.32847E-06	-0.20809E-06	0.53656E-06
2.00E 04	0.04263E-02	0.49725	8716.91	28229.1	0.71858E 06	-0.27420E-06	-0.29294E-06	0.56714E-06
2.05E 04	0.04541E-02	0.49773	9098.60	30390.3	0.75748E 06	-0.23263E-06	-0.36604E-06	0.59866E-06
2.10E 04	0.03660E-02	0.49807	9467.01	32663.2	0.79744E 06	-0.20035E-06	-0.43078E-06	0.63113E-06
2.15E 04	0.03342E-02	0.49833	9882.16	35051.0	0.83844E 06	-0.17495E-06	-0.48959E-06	0.66454E-06
2.20E 04	0.02910E-02	0.49854	10284.0	37557.1	0.88046E 06	-0.15470E-06	-0.54421E-06	0.69891E-06
2.25E 04	0.02583E-02	0.49871	10692.6	40184.6	0.92348E 06	-0.13834E-06	-0.59590E-06	0.73424E-06
2.30E 04	0.02311E-02	0.49884	11107.9	42936.9	0.96750E 06	-0.12496E-06	-0.64559E-06	0.77055E-06
2.35E 04	0.02087E-02	0.49896	11529.9	45817.3	0.10125E 07	-0.11388E-06	-0.69395E-06	0.80783E-06
2.40E 04	0.01801E-02	0.49905	11958.5	48829.0	0.10584E 07	-0.10460E-06	-0.74150E-06	0.84610E-06
2.45E 04	0.01740E-02	0.49913	12393.8	51975.4	0.11053E 07	-0.96730E-07	-0.78863E-06	0.88536E-06
2.50E 04	0.01613E-02	0.49919	12835.7	55259.7	0.11530E 07	-0.89986E-07	-0.83563E-06	0.92562E-06
2.55E 04	0.01495E-02	0.49925	13284.1	58685.3	0.12017E 07	-0.84145E-07	-0.88273E-06	0.96688E-06
2.60E 04	0.01395E-02	0.49930	13739.1	62255.5	0.12512E 07	-0.79037E-07	-0.93011E-06	0.10091E-05
2.65E 04	0.01304E-02	0.49935	14200.6	65973.7	0.13015E 07	-0.74526E-07	-0.97790E-06	0.10524E-05
2.70E 04	0.01231E-02	0.49938	14668.7	69843.3	0.13526E 07	-0.70508E-07	-0.10262E-05	0.10967E-05
2.75E 04	0.01162E-02	0.49942	15143.1	73867.6	0.14045E 07	-0.66900E-07	-0.10752E-05	0.11421E-05
2.80E 04	0.01111E-02	0.49945	15624.1	78050.1	0.14571E 07	-0.63633E-07	-0.11248E-05	0.11884E-05
2.85E 04	0.01061E-02	0.49948	16111.4	82394.2	0.15104E 07	-0.60656E-07	-0.11752E-05	0.12358E-05
2.90E 04	0.09553E-03	0.49950	16605.1	86903.2	0.15644E 07	-0.57924E-07	-0.12263E-05	0.12843E-05
2.95E 04	0.09502E-03	0.49952	17105.1	91580.7	0.16190E 07	-0.55401E-07	-0.12784E-05	0.13338E-05
3.00E 04	0.09035E-03	0.49955	17611.5	96430.2	0.16743E 07	-0.53058E-07	-0.13312E-05	0.13843E-05
3.05E 04	0.08584E-03	0.49957	18124.2	0.10145E 06	0.17301E 07	-0.50872E-07	-0.13850E-05	0.14359E-05
3.10E 04	0.08042E-03	0.49958	18643.2	0.10666E 06	0.17864E 07	-0.48822E-07	-0.14397E-05	0.14886E-05
3.15E 04	0.07410E-03	0.49960	19168.3	0.11204E 06	0.18432E 07	-0.46890E-07	-0.14954E-05	0.15423E-05
3.20E 04	0.07065E-03	0.49961	19699.8	0.11762E 06	0.19004E 07	-0.45065E-07	-0.15520E-05	0.15971E-05
3.25E 04	0.06604E-03	0.49963	20237.4	0.12338E 06	0.19581E 07	-0.43331E-07	-0.16097E-05	0.16530E-05
3.30E 04	0.06152E-03	0.49964	20781.1	0.12933E 06	0.20162E 07	-0.41681E-07	-0.16683E-05	0.17102E-05
3.35E 04	0.05619E-03	0.49965	21331.0	0.13548E 06	0.20746E 07	-0.40103E-07	-0.17279E-05	0.17680E-05
3.40E 04	0.05060E-03	0.49967	21887.1	0.14184E 06	0.21332E 07	-0.38592E-07	-0.17886E-05	0.18272E-05
3.45E 04	0.04448E-03	0.49968	22449.2	0.14839E 06	0.21922E 07	-0.37141E-07	-0.18503E-05	0.18874E-05
3.50E 04	0.03835E-03	0.49969	23017.4	0.15515E 06	0.22514E 07	-0.35743E-07	-0.19130E-05	0.19488E-05
3.55E 04	0.03035E-03	0.49970	23591.7	0.16213E 06	0.23107E 07	-0.34394E-07	-0.19768E-05	0.20112E-05
3.60E 04	0.02045E-03	0.49971	24171.9	0.16931E 06	0.23702E 07	-0.33088E-07	-0.20417E-05	0.20748E-05
3.65E 04	0.01602E-03	0.49972	24758.2	0.17672E 06	0.24298E 07	-0.31823E-07	-0.21077E-05	0.21395E-05
3.70E 04	0.01055E-03	0.49973	25350.4	0.18435E 06	0.24895E 07	-0.30595E-07	-0.21747E-05	0.22053E-05
3.75E 04	0.00835E-03	0.49973	25948.7	0.19220E 06	0.25492E 07	-0.29401E-07	-0.22428E-05	0.22722E-05
3.80E 04	0.00549E-03	0.49974	26552.8	0.20029E 06	0.26089E 07	-0.28237E-07	-0.23121E-05	0.23403E-05
3.85E 04	0.00384E-03	0.49975	27162.9	0.20860E 06	0.26686E 07	-0.27102E-07	-0.23824E-05	0.24095E-05
3.90E 04	0.00240E-03	0.49976	27778.6	0.21716E 06	0.27281E 07	-0.25994E-07	-0.24539E-05	0.24798E-05
3.95E 04	0.00164E-03	0.49976	28400.6	0.22595E 06	0.27876E 07	-0.24909E-07	-0.25264E-05	0.25513E-05
4.00E 04	0.00097E-03	0.49977	29028.3	0.23499E 06	0.28469E 07	-0.23847E-07	-0.26001E-05	0.26240E-05
4.05E 04	0.00044E-03	0.49977	29661.8	0.24428E 06	0.29060E 07	-0.22805E-07	-0.26750E-05	0.26978E-05

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(e) Continued. Pressure,  $10^{-1}$  atmosphere

Temperature, °K	Thermal conductivity, cal/(cm)(sec)(°K)				Viscosity, g/(cm)(sec)	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec		
	Transla- tional	Reaction	Diffusional	Total		$D_{H-H^+}$	$D_{H^+-e}$	$D_{H-e}$
T	$\lambda_t$	$\lambda_r$	$\lambda_d$	$\lambda$	$\eta$			
5.00E 03	0.41129E-02	0.17446E-05	-0.21108E-08	0.41146E-02	0.55612E-03	338.058	0.61768F 06	44346.9
5.50E 03	0.44502E-02	0.72366E-05	-0.33268E-09	0.44974E-02	0.60626E-03	395.012	0.71096F 06	63358.3
6.00E 03	0.48756E-02	0.23650E-04	0.57365E-07	0.49032E-02	0.65610E-03	455.283	0.78916E 06	0.10286E 06
6.50E 03	0.52878E-02	0.64313E-04	0.43902E-06	0.53522E-02	0.70504E-03	518.678	0.83451E 06	0.17892E 06
7.00E 03	0.57057E-02	0.15128E-03	0.19554E-05	0.58609E-02	0.75168E-03	585.019	0.83376E 06	0.30335F 06
7.50E 03	0.61230E-02	0.31661E-03	0.61902E-05	0.64396E-02	0.79304E-03	654.185	0.78531E 06	0.47713E 06
8.00E 03	0.66473E-02	0.60191E-03	0.15417E-04	0.70893E-02	0.82355E-03	726.129	0.69915E 06	0.69066E 06
8.50E 03	0.67501E-02	0.10554E-02	0.32468E-04	0.77915E-02	0.83455E-03	800.902	0.59320E 06	0.92726E 06
9.00E 03	0.67839E-02	0.17261E-02	0.60671E-04	0.85100E-02	0.81599E-03	878.650	0.48598E 06	0.11701E 07
9.50E 03	0.65723E-02	0.26532E-02	0.10354E-03	0.92255E-02	0.76143E-03	959.549	0.38958E 06	0.14084E 07
1.00E 04	0.61245E-02	0.38513E-02	0.16393E-03	0.99758E-02	0.67361E-03	1043.69	0.30866E 06	0.16381E 07
1.05E 04	0.55558E-02	0.52885E-02	0.24252E-03	0.10824E-01	0.56494E-03	1131.02	0.24299E 06	0.18596E 07
1.10E 04	0.49076E-02	0.68626E-02	0.33603E-03	0.11770E-01	0.45179E-03	1221.35	0.19044E 06	0.20744E 07
1.15E 04	0.43076E-02	0.83819E-02	0.43544E-03	0.12690E-01	0.34758E-03	1314.51	0.14856E 06	0.22845E 07
1.20E 04	0.37748E-02	0.95727E-02	0.52525E-03	0.13347E-01	0.25972E-03	1410.34	0.11529E 06	0.24917E 07
1.25E 04	0.33324E-02	0.10141E-01	0.58572E-03	0.13473E-01	0.19024E-03	1508.77	89065.7	0.26972E 07
1.30E 04	0.29934E-02	0.39898E-02	0.60001E-03	0.12891E-01	0.13794E-03	1609.72	68721.2	0.29202E 07
1.35E 04	0.27553E-02	0.68859E-02	0.56371E-03	0.11645E-01	0.10013E-03	1713.17	53329.5	0.31069E 07
1.40E 04	0.26213E-02	0.73843E-02	0.48879E-03	0.10006E-01	0.73711E-04	1819.09	42049.6	0.33127E 07
1.45E 04	0.25639E-02	0.57614E-02	0.39678E-03	0.83253E-02	0.55771E-04	1927.47	34073.5	0.35199E 07
1.50E 04	0.25052E-02	0.42985E-02	0.30722E-03	0.68681E-02	0.43870E-04	2038.29	28650.3	0.37294E 07
1.55E 04	0.26214E-02	0.31241E-02	0.23117E-03	0.57455E-02	0.36138E-04	2151.52	25133.8	0.39417E 07
1.60E 04	0.27677E-02	0.22452E-02	0.17169E-03	0.49529E-02	0.31226E-04	2267.15	23011.1	0.41572E 07
1.65E 04	0.26151E-02	0.16138E-02	0.12733E-03	0.44328E-02	0.28210E-04	2385.17	21899.5	0.43762E 07
1.70E 04	0.29490E-02	0.11691E-02	0.95047E-04	0.41181E-02	0.26471E-04	2505.53	21525.4	0.45989E 07
1.75E 04	0.36933E-02	0.65789E-03	0.71785E-04	0.39512E-02	0.25600E-04	2628.24	21697.8	0.48256E 07
1.80E 04	0.32490E-02	0.35959E-03	0.55027E-04	0.38886E-02	0.25329E-04	2753.26	22285.1	0.50561E 07
1.85E 04	0.34143E-02	0.48526E-03	0.42888E-04	0.38996E-02	0.25481E-04	2880.58	23197.1	0.52907E 07
1.90E 04	0.35880E-02	0.37493E-03	0.34012E-04	0.39629E-02	0.25937E-04	3010.16	24372.1	0.55293E 07
1.95E 04	0.37651E-02	0.29500E-03	0.27449E-04	0.40641E-02	0.26619E-04	3142.01	25767.7	0.57720E 07
2.00E 04	0.39571E-02	0.23628E-03	0.22533E-04	0.41934E-02	0.27473E-04	3276.09	27354.9	0.60187E 07
2.05E 04	0.41517E-02	0.19247E-03	0.18802E-04	0.43442E-02	0.28460E-04	3412.39	29113.9	0.62694E 07
2.10E 04	0.43525E-02	0.15930E-03	0.15931E-04	0.45119E-02	0.29556E-04	3550.89	31031.2	0.65240E 07
2.15E 04	0.45555E-02	0.13381E-03	0.13691E-04	0.46933E-02	0.30741E-04	3691.57	33097.9	0.67827E 07
2.20E 04	0.47725E-02	0.11392E-03	0.11919E-04	0.48864E-02	0.32004E-04	3834.41	35308.3	0.70453E 07
2.25E 04	0.49913E-02	0.98184E-04	0.10499E-04	0.50895E-02	0.33334E-04	3979.40	37659.0	0.73119E 07
2.30E 04	0.52161E-02	0.85557E-04	0.93465E-05	0.53016E-02	0.34726E-04	4126.53	40148.0	0.75823E 07
2.35E 04	0.54467E-02	0.75291E-04	0.83987E-05	0.55219E-02	0.36173E-04	4275.78	42775.1	0.78566E 07
2.40E 04	0.56831E-02	0.66840E-04	0.76101E-05	0.57499E-02	0.37672E-04	4427.12	45540.3	0.81348E 07
2.45E 04	0.59253E-02	0.69466E-05	0.69466E-05	0.59851E-02	0.39221E-04	4580.56	48444.9	0.84168E 07
2.50E 04	0.61733E-02	0.53874E-04	0.63822E-05	0.62272E-02	0.40817E-04	4736.07	51490.3	0.87026E 07
2.55E 04	0.64272E-02	0.48831E-04	0.58874E-05	0.64761E-02	0.42460E-04	4893.63	54678.4	0.89922E 07
2.60E 04	0.66870E-02	0.44501E-04	0.54769E-05	0.67315E-02	0.44147E-04	5053.25	58011.6	0.92856E 07
2.65E 04	0.69525E-02	0.40745E-04	0.51091E-05	0.69933E-02	0.45878E-04	5214.90	61492.4	0.95826E 07
2.70E 04	0.72240E-02	0.37473E-04	0.47848E-05	0.72615E-02	0.47652E-04	5378.57	65123.3	0.98834E 08
2.75E 04	0.75014E-02	0.34592E-04	0.44966E-05	0.75360E-02	0.49470E-04	5544.24	68907.3	0.10188E 08
2.80E 04	0.77847E-02	0.32041E-04	0.42389E-05	0.78167E-02	0.51329E-04	5711.92	72847.2	0.10496E 08
2.85E 04	0.80733E-02	0.29769E-04	0.40070E-05	0.81037E-02	0.53231E-04	5881.57	76946.3	0.10808E 08
2.90E 04	0.83651E-02	0.27734E-04	0.37970E-05	0.83968E-02	0.55176E-04	6053.20	81207.5	0.11123E 08
2.95E 04	0.86702E-02	0.25902E-04	0.36060E-05	0.86962E-02	0.57162E-04	6226.79	85634.1	0.11442E 08
3.00E 04	0.89774E-02	0.24246E-04	0.34314E-05	0.90017E-02	0.59190E-04	6402.33	90229.4	0.11765E 08
3.05E 04	0.92860E-02	0.22743E-04	0.32711E-05	0.93134E-02	0.61260E-04	6579.81	94996.7	0.12091E 08
3.10E 04	0.96059E-02	0.21373E-04	0.31234E-05	0.96313E-02	0.63372E-04	6759.21	99939.4	0.12421E 08
3.15E 04	0.99252E-02	0.20120E-04	0.29868E-05	0.99553E-02	0.65526E-04	6940.53	0.10506F 06	0.12754E 08
3.20E 04	0.10267E-01	0.18971E-04	0.28600E-05	0.10286E-01	0.67722E-04	7123.76	0.11036F 06	0.13091E 08
3.25E 04	0.10604E-01	0.17913E-04	0.27420E-05	0.10622E-01	0.69960E-04	7308.89	0.11585F 06	0.13431E 08
3.30E 04	0.10946E-01	0.16938E-04	0.26319E-05	0.10965E-01	0.72241F-04	7495.91	0.12153F 06	0.13774E 08
3.35E 04	0.11283E-01	0.16037E-04	0.25289E-05	0.11314E-01	0.74564E-04	7684.80	0.12740E 06	0.14122E 08
3.40E 04	0.11654E-01	0.15201E-04	0.24323E-05	0.11669E-01	0.76929E-04	7875.57	0.13347E 06	0.14472E 08
3.45E 04	0.12010E-01	0.14425E-04	0.23415E-05	0.12031E-01	0.79336E-04	8068.19	0.13974E 06	0.14826E 08
3.50E 04	0.12385E-01	0.13704E-04	0.22561E-05	0.12398E-01	0.81787E-04	8262.66	0.14621E 06	0.15184E 08
3.55E 04	0.12759E-01	0.13031E-04	0.21755E-05	0.12772E-01	0.84280E-04	8458.98	0.15289E 06	0.15544E 08
3.60E 04	0.13140E-01	0.12403E-04	0.20994E-05	0.13153E-01	0.86816E-04	8657.12	0.15978E 06	0.15908E 08
3.65E 04	0.13528E-01	0.11816E-04	0.20274E-05	0.13540E-01	0.89395E-04	8857.10	0.16688E 06	0.16276E 08
3.70E 04	0.13921E-01	0.11266E-04	0.19592E-05	0.13933E-01	0.92017E-04	9058.88	0.17420E 06	0.16647E 08
3.75E 04	0.14321E-01	0.10751E-04	0.18944E-05	0.14342E-01	0.94683E-04	9262.48	0.18175E 06	0.17021E 08
3.80E 04	0.14729E-01	0.10267E-04	0.18329E-05	0.14738E-01	0.97392E-04	9467.87	0.18952E 06	0.17398E 08
3.85E 04	0.15141E-01	0.98116E-05	0.17745E-05	0.15150E-01	0.10014E-03	9675.06	0.19752E 06	0.17779E 08
3.90E 04	0.15560E-01	0.93835E-05	0.17188E-05	0.15569E-01	0.10294E-03	9884.03	0.20575E 06	0.18163E 08
3.95E 04	0.15989E-01	0.89681E-05	0.16658E-05	0.15994E-01	0.10578E-03	10094.8	0.21422E 06	0.18550E 08
4.00E 04	0.16418E-01	0.85597E-05	0.16152E-05	0.16426E-01	0.10866E-03	10307.3	0.22292E 06	0.18941E 08
4.05E 04	0.16858E-01	0.82405E-05	0.15669E-05	0.16864E-01	0.11159E-03	10521.6	0.23188E 06	0.19335E 08

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(e) Continued. Pressure,  $10^{-1}$  atmosphere

Temperature, °K	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec			Shielded coulombic col- lision cross sections, $\bar{\Omega}_c^2$		Dimensionless parameters for shielded coulombic collisions		
T	D <sub>H<sup>+</sup>-H</sub>	D <sub>e-H</sub>	D <sub>e-H<sup>+</sup></sub>	$\bar{\Omega}_c^{(1,1)}$	$\bar{\Omega}_c^{(2,2)}$	A <sub>c</sub> <sup>*</sup>	B <sub>c</sub> <sup>*</sup>	C <sub>c</sub> <sup>*</sup>
5.00E 03	338.057	40771.9	40769.9	3597.36	3876.59	1.07762	1.05170	0.38508
5.50E 03	345.008	48396.9	48388.8	2702.68	2933.45	1.08539	1.05687	0.39026
6.00E 03	355.269	55347.3	55321.5	2085.76	2279.67	1.09297	1.06192	0.39531
6.50E 03	368.643	60296.4	60232.1	1646.62	1811.85	1.10034	1.06683	0.40023
7.00E 03	384.948	62122.2	61991.6	1325.51	1467.98	1.10748	1.07158	0.40499
7.50E 03	404.063	60442.3	60216.9	1085.26	1209.36	1.11435	1.07616	0.40957
8.00E 03	425.942	55711.1	55368.1	901.939	1011.01	1.12093	1.08054	0.41396
8.50E 03	449.090	49090.2	48616.5	759.683	856.303	1.12718	1.08470	0.41812
9.00E 03	478.320	41951.3	41343.6	647.704	733.886	1.13306	1.08862	0.42204
9.50E 03	505.147	35306.2	34567.6	558.495	635.845	1.13850	1.09224	0.42566
1.00E 04	535.222	29633.6	28769.4	486.732	556.540	1.14342	1.09552	0.42895
1.05E 04	565.448	25026.8	24042.5	428.561	491.879	1.14775	1.09840	0.43183
1.10E 04	595.75	21396.0	20295.9	381.147	438.840	1.15137	1.10081	0.43424
1.15E 04	626.05	18599.9	17387.1	342.357	395.142	1.15418	1.10268	0.43612
1.20E 04	649.42	16507.2	15184.0	310.546	359.024	1.15610	1.10397	0.43740
1.25E 04	667.99	15015.5	13583.2	284.402	329.079	1.15709	1.10462	0.43806
1.30E 04	680.88	14048.0	12507.5	262.833	304.140	1.15716	1.10467	0.43811
1.35E 04	692.27	13542.6	11894.1	244.903	283.206	1.15640	1.10416	0.43760
1.40E 04	701.14	13441.0	11684.3	229.805	265.421	1.15498	1.10322	0.43666
1.45E 04	708.46	13684.6	11819.2	216.870	250.072	1.15310	1.10196	0.43540
1.50E 04	713.21	1421.65	12241.4	205.570	236.596	1.15093	1.10052	0.43395
1.55E 04	715.39	14986.2	12900.2	195.518	224.575	1.14861	1.09898	0.43241
1.60E 04	724.56	15953.3	13754.8	186.439	213.708	1.14626	1.09741	0.43084
1.65E 04	736.51	17687.2	14774.7	178.141	203.782	1.14394	1.09586	0.42929
1.70E 04	7504.21	18366.7	15938.3	170.492	194.647	1.14168	1.09436	0.42779
1.75E 04	766.45	19777.2	17231.1	163.395	186.190	1.13950	1.09291	0.42634
1.80E 04	7751.81	21309.6	18643.9	156.782	178.327	1.13742	1.09152	0.42495
1.85E 04	7849.66	22558.3	20171.1	150.596	170.993	1.13544	1.09020	0.42363
1.90E 04	7968.98	24720.1	21809.6	144.796	164.133	1.13355	1.08894	0.42237
1.95E 04	8140.36	26593.9	23558.2	139.344	157.703	1.13175	1.08774	0.42117
2.00E 04	8274.37	28579.6	25410.8	134.211	151.663	1.13003	1.08660	0.42002
2.05E 04	8410.60	30678.1	27386.4	129.370	145.981	1.12848	1.08551	0.41893
2.10E 04	8545.62	32890.9	29468.4	124.798	140.627	1.12684	1.08448	0.41789
2.15E 04	8689.63	35219.9	31664.8	120.474	135.576	1.12535	1.08348	0.41690
2.20E 04	8832.40	37667.4	33977.9	116.381	130.804	1.12393	1.08254	0.41595
2.25E 04	8977.32	40235.8	36410.2	112.500	126.290	1.12257	1.08163	0.41505
2.30E 04	9124.37	42927.9	38964.4	108.819	122.015	1.12127	1.08076	0.41418
2.35E 04	9273.54	45746.4	41643.3	105.322	117.963	1.12002	1.07993	0.41335
2.40E 04	9424.81	48694.3	44450.0	101.998	114.117	1.11882	1.07913	0.41255
2.45E 04	9578.17	51774.6	47387.4	98.8344	110.464	1.11767	1.07837	0.41178
2.50E 04	9733.66	54990.3	50458.7	95.8217	106.991	1.11656	1.07763	0.41104
2.55E 04	9891.09	58344.6	53667.0	92.9499	103.685	1.11550	1.07692	0.41033
2.60E 04	9950.62	61840.7	57015.5	90.2104	100.537	1.11447	1.07624	0.40965
2.65E 04	9921.15	65481.8	60507.6	87.5949	97.5355	1.11348	1.07558	0.40899
2.70E 04	9975.78	69271.1	64146.4	85.0959	94.6717	1.11253	1.07495	0.40835
2.75E 04	9941.37	73212.0	67935.3	82.7065	91.9373	1.11161	1.07433	0.40774
2.80E 04	9908.50	77307.8	71877.7	80.4203	89.3243	1.11072	1.07374	0.40715
2.85E 04	9876.53	81561.8	75976.9	78.2312	86.8256	1.10986	1.07317	0.40657
2.90E 04	9845.08	85977.3	80236.4	76.1339	84.4345	1.10903	1.07261	0.40602
2.95E 04	9814.38	90557.9	84659.6	74.1231	82.1447	1.10822	1.07207	0.40548
3.00E 04	9784.33	95306.8	89249.9	72.1940	79.9505	1.10744	1.07155	0.40496
3.05E 04	9754.42	100023E 06	94010.9	70.3473	77.8465	1.10668	1.07105	0.40445
3.10E 04	9724.74	104732E 06	98945.9	68.5637	75.8276	1.10595	1.07056	0.40396
3.15E 04	9695.98	0.11060E 06	0.11040E 06	66.8544	73.8997	1.10523	1.07009	0.40349
3.20E 04	9667.12	0.11006E 06	0.110935E 06	65.2107	72.0279	1.10454	1.06962	0.40303
3.25E 04	9638.16	0.112170E 06	0.111483E 06	63.6294	70.2384	1.10387	1.06918	0.40258
3.30E 04	9609.08	0.112753E 06	0.112050E 06	62.1071	68.5174	1.10321	1.06874	0.40214
3.35E 04	9580.49	0.113355E 06	0.112636E 06	60.6410	66.8614	1.10258	1.06832	0.40172
3.40E 04	9551.50	0.113978E 06	0.113241E 06	59.2283	65.2670	1.10196	1.06790	0.40130
3.45E 04	9522.05	0.114620E 06	0.113866E 06	57.8663	63.7313	1.10135	1.06750	0.40090
3.50E 04	9492.47	0.115282E 06	0.114512E 06	56.5527	62.2513	1.10077	1.06711	0.40051
3.55E 04	9463.69	0.115965E 06	0.115178E 06	55.2850	60.8242	1.10019	1.06673	0.40013
3.60E 04	9434.70	0.116669E 06	0.115865E 06	54.0612	59.4477	1.09964	1.06636	0.39976
3.65E 04	9405.62	0.117395E 06	0.116574E 06	52.8793	58.1191	1.09909	1.06599	0.39939
3.70E 04	9376.32	0.118143E 06	0.117304E 06	51.7372	56.8364	1.09856	1.06564	0.39904
3.75E 04	9347.62	0.118912E 06	0.118057E 06	50.6332	55.5973	1.09804	1.06530	0.39869
3.80E 04	9318.12	0.119704E 06	0.118831E 06	49.5655	54.3993	1.09753	1.06496	0.39836
3.85E 04	9288.41	0.120519E 06	0.119629E 06	48.5327	53.2423	1.09704	1.06463	0.39803
3.90E 04	9258.09	0.121358E 06	0.120450E 06	47.5330	52.1226	1.09656	1.06431	0.39770
3.95E 04	9227.77	0.122220E 06	0.121295E 06	46.5652	51.0394	1.09608	1.06399	0.39739
4.00E 04	9197.22	0.123106E 06	0.122163E 06	45.6278	49.9908	1.09562	1.06368	0.39708
4.05E 04	9166.53	0.124016E 06	0.123056E 06	44.7196	48.9755	1.09517	1.06338	0.39678

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(e) Concluded. Pressure,  $10^{-1}$  atmosphere

Temperature, °K	Pure gas thermal conductivity, cal/(cm)(sec)(°K)		Pure gas viscosity, g/(cm)(sec)		Binary mixture thermal conductivity parameter, cal (cm)(sec)(°K)	Viscosity parameter, g/(cm)(sec)	Electrical conductivity second ap- proximation parameter	Electrical conductivity, mhos/m
T	$\lambda_{H^+}$	$\lambda_e$	$\eta_{H^+}$	$\eta_e$	$\lambda_{H^+-e}$	$\eta_{H^+-e}$	$\Delta_c$	$\sigma$
5.00E 03	0.26136E-C5	C.15492E-03	0.48884E-06	0.11403E-07	0.10957E-03	0.16126E-07	0.55273E-03	2.82816
5.50E 03	C.50088E-C5	0.21472E-03	0.67753E-06	0.15805E-07	0.15187E-03	0.22351E-07	0.73503E-06	13.1483
6.00E 03	C.67318E-C5	0.28858E-03	0.91061E-06	0.21242E-07	0.20412E-03	0.30040E-07	0.15825E-02	46.4345
6.50E 03	0.86158E-C5	0.37752E-03	0.11925E-05	0.27818E-07	0.26730E-03	0.39340E-07	0.11345E-01	129.611
7.00E 03	0.11292E-C4	0.48406E-03	0.15274E-05	0.35630E-07	0.34237E-03	0.50388E-07	0.38366E-01	294.637
7.50E 03	0.14187E-C4	C.60819E-C3	0.19191E-05	0.44767E-07	0.43017E-03	0.63310E-07	0.84501E-01	561.853
8.00E 03	0.17527E-C4	C.75137E-03	0.23709E-05	0.55306E-07	0.53145E-03	0.78215E-07	0.13893	925.784
8.50E 03	0.21331E-C4	C.91443E-03	0.28854E-05	0.67308E-07	0.64678E-03	0.95188E-07	0.18832	1357.14
9.00E 03	C.25611E-C4	C.10579E-02	0.34643E-05	0.80812E-07	0.77654E-03	0.11429E-06	0.22617	1820.08
9.50E 03	C.30329E-C4	C.13019E-02	0.41081E-05	0.95829E-07	0.92084E-03	0.13552E-06	0.25245	2287.84
1.00E 04	C.35558E-C4	0.15261E-02	0.48154E-05	0.11233E-06	0.10794E-02	0.15886E-06	0.26973	2746.25
1.05E 04	C.41273E-C4	0.17693E-02	0.55830E-05	0.13023E-06	0.12514E-02	0.18418E-06	0.28080	3189.60
1.10E 04	C.47350E-C4	C.20298E-02	0.64050E-05	0.14941E-06	0.14357E-02	0.21130E-06	0.28790	3615.71
1.15E 04	C.53768E-C4	0.23050E-02	0.72732E-05	0.16966E-06	0.16303E-02	0.23954E-06	0.29261	4022.97
1.20E 04	0.60450E-04	0.25914E-02	0.81770E-05	0.19074E-06	0.18329E-02	0.26975E-06	0.29602	4409.26
1.25E 04	0.66450E-04	0.28855E-02	C.91050E-05	0.21239E-06	0.20409E-02	0.30037E-06	0.29882	4772.14
1.30E 04	0.74272E-C4	0.31840E-02	C.10047E-04	0.23436E-06	0.22520E-02	0.33144E-06	0.30142	5109.85
1.35E 04	0.81281E-C4	0.34844E-02	0.10995E-04	0.25648E-06	0.24645E-02	0.36271E-06	0.30405	5422.31
1.40E 04	0.88219E-C4	C.37861E-02	0.11947E-04	0.27869E-06	0.26779E-02	0.39412E-06	0.30677	5711.64
1.45E 04	0.95359E-04	0.40897E-02	0.12905E-04	0.30103E-06	0.28926E-02	0.42572E-06	0.30954	5981.70
1.50E 04	C.10226E-C3	C.43965E-02	0.13873E-04	0.32361E-06	0.31096E-02	0.45766E-06	0.31233	6237.12
1.55E 04	C.10982E-C3	C.47084E-02	0.14857E-04	0.34657E-06	0.33302E-02	0.49012E-06	0.31507	6482.25
1.60E 04	C.11726E-C3	0.50276E-02	0.15862E-04	0.37002E-06	0.35556E-02	0.52329E-06	0.31773	6720.63
1.65E 04	0.12468E-03	0.53536E-02	0.16893E-04	0.39406E-06	0.37866E-02	0.55728E-06	0.32028	6954.89
1.70E 04	C.13271E-C3	0.56891E-02	0.17952E-04	0.41876E-06	0.40239E-02	0.59221E-06	0.32271	7186.86
1.75E 04	C.14076E-C3	0.60344E-02	0.19041E-04	0.44417E-06	0.42681E-02	0.62815E-06	0.32502	7417.77
1.80E 04	C.14903E-03	0.63898E-02	0.20063E-04	0.47033E-06	0.45195E-02	0.66515E-06	0.32722	7648.46
1.85E 04	C.15759E-C3	0.67558E-02	0.21317E-04	0.49727E-06	0.47784E-02	0.70325E-06	0.32931	7879.46
1.90E 04	C.16636E-03	0.71326E-02	0.22507E-04	0.52501E-06	0.50449E-02	0.74247E-06	0.33130	8111.12
1.95E 04	C.17543E-C3	C.75255E-02	0.23730E-04	0.55356E-06	0.53192E-02	0.78285E-06	0.33319	8343.67
2.00E 04	0.18474E-03	0.79196E-02	0.24990E-04	0.58294E-06	0.56015E-02	0.82440E-06	0.33498	8577.28
2.05E 04	0.19432E-C3	C.83301E-02	0.26285E-04	0.61315E-06	0.58919E-02	0.86712E-06	0.33670	8812.02
2.10E 04	0.20416E-C3	0.87520E-02	0.27616E-04	0.64421E-06	0.61903E-02	0.91105E-06	0.33833	9047.97
2.15E 04	0.21427E-C3	C.91855E-02	0.28984E-04	0.67612E-06	0.64969E-02	0.95617E-06	0.33990	9285.15
2.20E 04	0.22466E-C3	C.96307E-C2	0.30389E-04	0.70889E-06	0.68118E-02	0.10025E-05	0.34139	9523.60
2.25E 04	C.23532E-C3	C.10088E-C1	C.31831E-04	0.74252E-06	0.71350E-02	0.10501E-05	0.34282	9763.32
2.30E 04	0.24625E-C3	0.10556E-01	0.33310E-04	0.77703E-06	0.74666E-02	0.10989E-05	0.34420	10004.3
2.35E 04	C.25740E-C3	C.11037E-01	0.34827E-04	0.81241E-06	0.78066E-02	0.11489E-05	0.34551	10246.6
2.40E 04	C.26856E-C3	C.11530E-01	0.36382E-04	0.84867E-06	0.81550E-02	0.12002E-05	0.34678	10490.1
2.45E 04	C.28073E-C3	C.12035E-01	0.37974E-04	0.88582E-06	0.85120E-02	0.12527E-05	0.34800	10734.9
2.50E 04	C.29279E-C3	0.12551E-01	0.39605E-04	0.92387E-06	0.88776E-02	0.13065E-05	0.34917	10980.9
2.55E 04	C.30513E-C3	C.13080E-01	0.41274E-04	0.96280E-06	0.92517E-02	0.13616E-05	0.35030	11228.1
2.60E 04	0.31775E-C3	C.13622E-01	0.42982E-04	0.10026E-05	0.96346E-02	0.14180E-05	0.35139	11476.6
2.65E 04	0.33065E-C3	0.14175E-01	0.44729E-04	0.10434E-05	0.10026E-01	0.14756E-05	0.35244	11726.3
2.70E 04	0.34387E-C3	C.14741E-01	0.46515E-04	0.10850E-05	0.10426E-01	0.15345E-05	0.35345	11977.2
2.75E 04	0.35736E-C3	C.15319E-01	0.48340E-04	0.11276E-05	0.10835E-01	0.15947E-05	0.35443	12229.2
2.80E 04	0.37114E-C3	C.15910E-01	0.50204E-04	0.11711E-05	0.11253E-01	0.16562E-05	0.35538	12482.5
2.85E 04	C.38521E-C3	C.16514E-01	0.52108E-04	0.12155E-05	0.11680E-01	0.17190E-05	0.35630	12736.9
2.90E 04	0.39950E-C3	0.17130E-01	0.54051E-04	0.12609E-05	0.12116E-01	0.17831E-05	0.35719	12992.4
2.95E 04	0.41425E-C3	C.17758E-01	0.56035E-04	0.13071E-05	0.12560E-01	0.18486E-05	0.35806	13249.1
3.00E 04	C.42921E-C3	0.18400E-01	0.58059E-04	0.13543E-05	0.13014E-01	0.19153E-05	0.35889	13506.9
3.05E 04	C.44446E-C3	C.19054E-01	0.60123E-04	0.14025E-05	0.13477E-01	0.19834E-05	0.35970	13765.8
3.10E 04	C.46002E-C3	C.19721E-01	0.62227E-04	0.14516E-05	0.13948E-01	0.20528E-05	0.36049	14025.9
3.15E 04	C.47588E-C3	C.20400E-01	0.64372E-04	0.15016E-05	0.14429E-01	0.21236E-05	0.36172	14287.0
3.20E 04	0.49204E-C3	C.21093E-01	0.66558E-04	0.15526E-05	0.14919E-01	0.21957E-05	0.36200	14549.2
3.25E 04	C.50850E-C3	0.21799E-01	0.68785E-04	0.16045E-05	0.15418E-01	0.22692E-05	0.36273	14812.5
3.30E 04	C.52527E-C3	C.22518E-01	0.71053E-04	0.16575E-05	0.15927E-01	0.23440E-05	0.36343	15076.8
3.35E 04	0.54234E-03	0.23250E-01	0.73363E-04	0.17113E-05	0.16444E-01	0.24202E-05	0.36412	15342.2
3.40E 04	C.55972E-C3	C.23995E-01	0.75713E-04	0.17662E-05	0.16971E-01	0.24977E-05	0.36479	15608.4
3.45E 04	0.57741E-C3	0.24753E-01	0.78106E-04	0.18220E-05	0.17508E-01	0.25747E-05	0.36544	15876.1
3.50E 04	C.59540E-C3	0.25524E-01	0.80540E-04	0.18788E-05	0.18053E-01	0.26570E-05	0.36607	16144.6
3.55E 04	0.61371E-C3	0.26309E-01	0.83017E-04	0.19365E-05	0.18608E-01	0.27387E-05	0.36669	16414.1
3.60E 04	C.63233E-C3	C.27107E-01	0.85535E-04	0.19953E-05	0.19173E-01	0.28217E-05	0.36730	16684.6
3.65E 04	0.65126E-C3	0.27919E-01	0.88096E-04	0.20550E-05	0.19747E-01	0.29062E-05	0.36789	16956.1
3.70E 04	0.67050E-C3	0.28744E-01	0.90699E-04	0.21157E-05	0.20330E-01	0.29921E-05	0.36846	17228.6
3.75E 04	C.69006E-C3	0.29582E-01	0.93345E-04	0.21774E-05	0.20923E-01	0.30794E-05	0.36903	17502.1
3.80E 04	0.70954E-C3	0.30434E-01	0.96033E-04	0.22402E-05	0.21526E-01	0.31681E-05	0.36957	17776.5
3.85E 04	C.72013E-C3	C.31300E-01	0.98765E-04	0.23039E-05	0.22138E-01	0.32582E-05	0.37011	18052.0
3.90E 04	C.75004E-C3	C.32175E-01	0.10154E-03	0.23686E-05	0.22760E-01	0.33497E-05	0.37064	18328.4
3.95E 04	0.77147E-C3	C.33072E-01	0.10436E-03	0.24343E-05	0.23392E-01	0.34427E-05	0.37115	18605.7
4.00E 04	0.79262E-C3	0.33975E-01	0.10722E-03	0.25011E-05	0.24033E-01	0.35370E-05	0.37165	18884.0
4.05E 04	C.81409E-C3	0.34899E-01	0.11012E-03	0.25688E-05	0.24684E-01	0.36329E-05	0.37215	19163.2

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(f) Pressure,  $10^0$  atmosphere

Temperature, °K	Mole fractions		Binary diffusion coefficients, cm <sup>2</sup> /sec			Thermal diffusion coefficients, g/(cm)(sec)		
T	X <sub>H</sub>	X <sub>H<sup>+</sup></sub>	D <sub>H-H<sup>+</sup></sub>	D <sub>H<sup>+</sup>-e</sub>	D <sub>H-e</sub>	D <sub>H</sub> <sup>T</sup>	D <sub>H<sup>+</sup></sub> <sup>T</sup>	D <sub>e</sub> <sup>T</sup>
5.00E 03	0.99999	0.34134E-C5	80.7055	14.4716	11497.7	-0.12320E-09	0.12402E-09	-0.81970E-12
5.50E 03	0.99997	0.16127E-C4	94.8446	22.4335	13748.3	-0.61062E-09	0.61278E-09	-0.21524E-11
6.00E 03	0.99988	0.59376E-C4	109.729	33.4351	16169.3	-0.23118E-08	0.23089E-08	0.29302E-11
6.50E 03	0.99964	0.18032E-C3	125.069	48.2048	18712.3	-0.70183E-08	0.69538E-08	0.64470E-10
7.00E 03	0.99906	0.47038E-C3	140.408	67.5499	21291.3	-0.17792E-07	0.17407E-07	0.38532E-09
7.50E 03	0.99763	0.10459E-C2	155.147	92.3514	23783.1	-0.39716E-07	0.38204E-07	0.15119E-08
8.00E 03	0.99546	0.22681E-C2	168.674	123.555	26048.9	-0.83897E-07	0.79456E-07	0.44413E-08
8.50E 03	0.99125	0.43596E-C2	180.574	162.160	27969.1	-0.17784E-06	0.16744E-06	0.10396E-07
9.00E 03	0.98458	0.78123E-C2	190.887	209.200	29485.9	-0.37904E-06	0.35870E-06	0.20335E-07
9.50E 03	0.97363	0.13183E-C1	200.246	265.719	30621.9	-0.78011E-06	0.74552E-06	0.34587E-07
1.00E 04	0.95778	0.21111E-C1	209.841	332.738	31466.5	-0.14910E-05	0.14381E-05	0.52872E-07
1.05E 04	0.93544	0.32279E-01	221.182	411.214	32140.6	-0.25923E-05	0.25178E-05	0.74568E-07
1.10E 04	0.90531	0.47344E-01	235.756	501.964	32761.0	-0.40761E-05	0.39771E-05	0.98980E-07
1.15E 04	0.86629	0.66854E-C1	254.674	605.707	33420.8	-0.58151E-05	0.56896E-05	0.12548E-06
1.20E 04	0.81773	0.91136E-C1	278.437	722.795	34184.2	-0.75926E-05	0.74391E-05	0.15353E-06
1.25E 04	0.75563	0.12019	306.875	853.351	35091.7	-0.91757E-05	0.89930E-05	0.18275E-06
1.30E 04	0.68286	0.15357	339.279	997.121	36167.7	-0.10381E-04	0.10169E-04	0.21282E-06
1.35E 04	0.61922	0.19039	374.649	1153.49	37427.8	-0.11105E-04	0.10862E-04	0.24353E-06
1.40E 04	0.56143	0.22929	411.939	1321.49	38883.5	-0.11319E-04	0.11043E-04	0.27472E-06
1.45E 04	0.46282	0.26859	450.245	1499.96	40544.9	-0.11051E-04	0.10745E-04	0.30628E-06
1.50E 04	0.38693	0.30653	488.890	1687.66	42421.0	-0.10381E-04	0.10043E-04	0.33815E-06
1.55E 04	0.31691	0.34155	527.441	1883.52	44518.1	-0.94170E-05	0.90468E-05	0.37029E-06
1.60E 04	0.25504	0.37248	565.681	2086.78	46838.2	-0.82822E-05	0.78795E-05	0.40527E-06
1.65E 04	0.20248	0.39876	603.557	2297.15	49377.6	-0.70961E-05	0.66607E-05	0.43545E-06
1.70E 04	0.15533	0.42033	641.128	2514.79	52126.7	-0.59558E-05	0.54872E-05	0.46859E-06
1.75E 04	0.12484	0.43758	678.514	2740.21	55071.6	-0.49255E-05	0.44233E-05	0.50222E-06
1.80E 04	0.97614E-C1	0.45109	715.860	2974.15	58196.6	-0.40366E-05	0.35002E-05	0.53644E-06
1.85E 04	0.76906E-01	0.46155	753.306	3217.48	61486.4	-0.32949E-05	0.27236E-05	0.57134E-06
1.90E 04	0.60883E-C1	0.46957	790.977	3471.03	64927.1	-0.26900E-05	0.20830E-05	0.60698E-06
1.95E 04	0.44853E-C1	0.47572	828.977	3735.63	68507.6	-0.22037E-05	0.15603E-05	0.64345E-06
2.00E 04	0.35120E-C1	0.48044	867.388	4012.03	72218.7	-0.18160E-05	0.11352E-05	0.68080E-06
2.05E 04	0.31657E-C1	0.48407	906.273	4300.89	76053.2	-0.15078E-05	0.78872E-06	0.71907E-06
2.10E 04	0.26232E-C1	0.48688	945.680	4602.83	80005.6	-0.12627E-05	0.50445E-06	0.75830E-06
2.15E 04	0.21845E-C1	0.48908	985.645	4918.41	84071.3	-0.10673E-05	0.26883E-06	0.79852E-06
2.20E 04	0.18356E-C1	0.49080	1026.19	5248.16	88246.4	-0.91080E-06	0.71049E-07	0.83975E-06
2.25E 04	0.15662E-C1	0.49217	1067.34	5592.55	92527.6	-0.78463E-06	-0.97394E-07	0.88203E-06
2.30E 04	0.13475E-01	0.49326	1109.11	5952.06	96911.9	-0.68226E-06	-0.24310E-06	0.92536E-06
2.35E 04	0.11710E-C1	0.49415	1151.50	6327.12	0.10140E 06	-0.59857E-06	-0.37120E-06	0.96977E-06
2.40E 04	0.10273E-C1	0.49486	1194.52	6718.18	0.10598E 06	-0.52963E-06	-0.48563E-06	0.10153E-05
2.45E 04	0.90623E-C2	0.49545	1238.18	7125.64	0.11066E 06	-0.47238E-06	-0.58947E-06	0.10619E-05
2.50E 04	0.81142E-C2	0.49594	1282.48	7549.92	0.11542E 06	-0.42447E-06	-0.68509E-06	0.11096E-05
2.55E 04	0.72909E-02	0.49635	1327.42	7991.44	0.12028E 06	-0.38403E-06	-0.77435E-06	0.11584E-05
2.60E 04	0.66682E-02	0.49670	1373.00	8450.59	0.12523E 06	-0.34964E-06	-0.85870E-06	0.12083E-05
2.65E 04	0.60623E-02	0.49695	1419.22	8927.79	0.13025E 06	-0.32015E-06	-0.93928E-06	0.12594E-05
2.70E 04	0.55227E-C2	0.49724	1466.08	9423.43	0.13536E 06	-0.29468E-06	-0.10170E-05	0.13117E-05
2.75E 04	0.50511E-02	0.49745	1513.56	9937.91	0.14055E 06	-0.27249E-06	-0.10926E-05	0.13651E-05
2.80E 04	0.47163E-C2	0.49764	1561.71	10471.6	0.14581E 06	-0.25304E-06	-0.11666E-05	0.14196E-05
2.85E 04	0.43888E-C2	0.49781	1610.48	11025.0	0.15113E 06	-0.23585E-06	-0.12395E-05	0.14754E-05
2.90E 04	0.41003E-C2	0.49795	1659.89	11598.4	0.15653E 06	-0.22056E-06	-0.13117E-05	0.15323E-05
2.95E 04	0.38451E-C2	0.49808	1709.92	12192.3	0.16199E 06	-0.20687E-06	-0.13835E-05	0.15903E-05
3.00E 04	0.36179E-C2	0.49819	1760.59	12807.0	0.16751E 06	-0.19453E-06	-0.14551E-05	0.16496E-05
3.05E 04	0.34145E-C2	0.49829	1811.88	13443.0	0.17309E 06	-0.18333E-06	-0.15267E-05	0.17101E-05
3.10E 04	0.32314E-C2	0.49838	1863.80	14100.7	0.17872E 06	-0.17312E-06	-0.15986E-05	0.17717E-05
3.15E 04	0.30659E-C2	0.49847	1916.33	14780.4	0.18440E 06	-0.16375E-06	-0.16708E-05	0.18346E-05
3.20E 04	0.29150E-C2	0.49854	1969.49	15482.6	0.19013E 06	-0.15511E-06	-0.17436E-05	0.18987E-05
3.25E 04	0.27785E-C2	0.49861	2023.27	16207.6	0.19590E 06	-0.14710E-06	-0.18169E-05	0.19640E-05
3.30E 04	0.26529E-C2	0.49867	2077.66	16956.0	0.20170E 06	-0.13964E-06	-0.18909E-05	0.20305E-05
3.35E 04	0.25375E-C2	0.49873	2132.67	17728.1	0.20754E 06	-0.13266E-06	-0.19656E-05	0.20982E-05
3.40E 04	0.24310E-C2	0.49878	2188.28	18524.3	0.21341E 06	-0.12610E-06	-0.20411E-05	0.21672E-05
3.45E 04	0.23325E-C2	0.49883	2244.50	19345.0	0.21931E 06	-0.11991E-06	-0.21175E-05	0.22374E-05
3.50E 04	0.22410E-C2	0.49888	2301.34	20190.7	0.22523E 06	-0.11406E-06	-0.21949E-05	0.23089E-05
3.55E 04	0.21559E-C2	0.49892	2358.77	21061.7	0.23116E 06	-0.10849E-06	-0.22731E-05	0.23816E-05
3.60E 04	0.20764E-C2	0.49896	2416.81	21959.6	0.23711E 06	-0.10318E-06	-0.23524E-05	0.24556E-05
3.65E 04	0.20021E-C2	0.49900	2475.44	22881.6	0.24307E 06	-0.99109E-07	-0.24327E-05	0.25308E-05
3.70E 04	0.19324E-C2	0.49903	2534.67	23831.3	0.24904E 06	-0.93244E-07	-0.25141E-05	0.26073E-05
3.75E 04	0.18669E-C2	0.49907	2594.50	24809.0	0.25501E 06	-0.88565E-07	-0.25956E-05	0.26851E-05
3.80E 04	0.18052E-C2	0.49910	2654.92	25812.2	0.26099E 06	-0.84054E-07	-0.26800E-05	0.27641E-05
3.85E 04	0.17470E-C2	0.49913	2715.94	26844.3	0.26695E 06	-0.79695E-07	-0.27647E-05	0.28444E-05
3.90E 04	0.16920E-C2	0.49915	2777.54	27904.8	0.27291E 06	-0.75474E-07	-0.28505E-05	0.29260E-05
3.95E 04	0.16397E-C2	0.49918	2839.73	28993.9	0.27886E 06	-0.71378E-07	-0.29375E-05	0.30089E-05
4.00E 04	0.15905E-C2	0.49920	2902.92	30112.3	0.28477E 06	-0.67395E-07	-0.30256E-05	0.30930E-05
4.05E 04	0.15436E-C2	0.49923	2965.86	31267.3	0.29071E 06	-0.63515E-07	-0.31150E-05	0.31785E-05

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(f) Continued. Pressure,  $10^0$  atmosphere

Temperature, °K	Thermal conductivity, cal/(cm)(sec)(°K)				Viscosity, g/(cm)(sec)	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec		
	Transla- tional	Reaction	Diffusional	Total		$D_{H-H^+}$	$D_{H^+-e}$	$D_{H-e}$
T	$\lambda_t$	$\lambda_r$	$\lambda_d$	$\lambda$	$\eta$	$D_{H-H^+}$	$D_{H^+-e}$	$D_{H-e}$
5.00E 03	0.41119E-02	0.55174E-06	-0.77315E-09	0.41124E-02	0.55614E-03	33.8071	62024.9	4198.03
5.50E 03	0.44854E-02	0.72891E-05	-0.17975E-08	0.44877E-02	0.60637E-03	39.5067	72164.8	5350.63
6.00E 03	0.48641E-02	0.74852E-05	0.22027E-08	0.48716E-02	0.65652E-03	45.5454	82258.7	7209.02
6.50E 03	0.52549E-02	0.20378E-04	0.44529E-07	0.52752E-02	0.70645E-03	51.9094	91524.0	10474.7
7.00E 03	0.56655E-02	0.48028E-04	0.25085E-06	0.57135E-02	0.75578E-03	58.5849	98913.4	16089.3
7.50E 03	0.60988E-02	0.10084E-03	0.95541E-06	0.61997E-02	0.80371E-03	65.5585	0.10342E 06	24950.0
8.00E 03	0.65477E-02	0.28094E-05	0.28094E-05	0.67403E-02	0.84880E-03	72.8192	0.10444E 06	37586.4
8.50E 03	0.69949E-02	0.34038E-03	0.67859E-05	0.73353E-02	0.88858E-03	80.3591	0.10189E 06	54024.4
9.00E 03	0.74140E-02	0.56307E-03	0.14084E-04	0.79770E-02	0.91924E-03	88.1738	96238.8	73817.4
9.50E 03	0.77670E-02	0.88039E-03	0.26024E-04	0.86474E-02	0.93557E-03	96.2631	88332.4	96163.2
1.00E 04	0.80033E-02	0.13106E-02	0.43975E-04	0.93174E-02	0.93174E-03	104.631	79195.6	0.12012E 06
1.05E 04	0.80882E-02	0.18680E-02	0.65261E-04	0.99562E-02	0.90315E-03	113.283	69754.8	0.14484E 06
1.10E 04	0.75881E-02	0.25592E-02	0.10298E-03	0.10547E-01	0.84853E-03	122.226	60670.3	0.16975E 06
1.15E 04	0.77207E-02	0.33794E-02	0.14576E-03	0.11100E-01	0.77147E-03	131.462	52313.1	0.19450E 06
1.20E 04	0.73334E-02	0.43070E-02	0.19736E-03	0.11641E-01	0.67955E-03	140.989	44831.1	0.21897E 06
1.25E 04	0.68650E-02	0.53018E-02	0.25637E-03	0.12187E-01	0.58192E-03	150.798	38236.5	0.24313E 06
1.30E 04	0.64257E-02	0.62565E-02	0.31984E-03	0.12726E-01	0.48679E-03	160.880	32475.9	0.26703E 06
1.35E 04	0.60033E-02	0.72035E-02	0.38312E-03	0.13207E-01	0.39988E-03	171.225	27474.7	0.29071E 06
1.40E 04	0.56301E-02	0.79197E-02	0.44004E-03	0.13550E-01	0.32423E-03	181.825	23159.6	0.31424E 06
1.45E 04	0.53237E-02	0.83456E-02	0.48368E-03	0.13669E-01	0.26080E-03	192.674	19467.3	0.33766E 06
1.50E 04	0.50507E-02	0.84109E-02	0.50786E-03	0.13502E-01	0.20914E-03	203.768	16344.1	0.36434E 06
1.55E 04	0.48315E-02	0.81001E-02	0.50904E-03	0.13032E-01	0.16807E-03	215.102	13741.5	0.38434E 06
1.60E 04	0.46425E-02	0.74635E-02	0.48764E-03	0.12306E-01	0.13609E-03	226.676	11611.6	0.40768E 06
1.65E 04	0.46168E-02	0.66040E-02	0.44809E-03	0.11421E-01	0.11164E-03	238.485	9903.74	0.43107E 06
1.70E 04	0.46481E-02	0.56449E-02	0.39726E-03	0.10491E-01	0.93237E-04	250.529	8563.75	0.45457E 06
1.75E 04	0.45216E-02	0.46952E-02	0.34226E-03	0.96168E-02	0.79597E-04	262.805	7536.62	0.47822E 06
1.80E 04	0.50352E-02	0.38295E-02	0.28876E-03	0.88647E-02	0.69631E-04	275.311	6769.50	0.50207E 06
1.85E 04	0.51759E-02	0.30849E-02	0.24032E-03	0.82648E-02	0.62466E-04	288.046	6214.62	0.52616E 06
1.90E 04	0.53498E-02	0.24697E-02	0.19852E-03	0.76195E-02	0.57418E-04	301.007	5830.92	0.55052E 06
1.95E 04	0.55405E-02	0.15747E-02	0.16360E-03	0.75153E-02	0.53965E-04	314.193	5584.55	0.57517E 06
2.00E 04	0.57485E-02	0.15830E-02	0.13502E-03	0.73315E-02	0.51716E-04	327.603	5448.39	0.60015E 06
2.05E 04	0.59711E-02	0.12758E-02	0.11192E-03	0.72469E-02	0.50381E-04	341.234	5401.17	0.62547E 06
2.10E 04	0.62044E-02	0.10357E-02	0.93363E-04	0.72421E-02	0.49743E-04	355.084	5426.43	0.65114E 06
2.15E 04	0.64530E-02	0.64784E-03	0.78476E-04	0.73008E-02	0.49643E-04	369.153	5511.53	0.67716E 06
2.20E 04	0.67057E-02	0.70049E-03	0.66519E-04	0.74102E-02	0.49963E-04	383.438	5646.86	0.70355E 06
2.25E 04	0.69758E-02	0.58428E-03	0.56881E-04	0.75601E-02	0.50616E-04	397.938	5825.06	0.73031E 06
2.30E 04	0.72502E-02	0.49402E-03	0.49072E-04	0.77428E-02	0.51535E-04	412.651	6040.58	0.75744E 06
2.35E 04	0.75340E-02	0.41824E-03	0.42708E-04	0.79522E-02	0.52673E-04	427.576	6289.16	0.78495E 06
2.40E 04	0.78252E-02	0.35876E-03	0.37435E-04	0.81840E-02	0.53991E-04	442.711	6567.61	0.81282E 06
2.45E 04	0.81247E-02	0.31041E-03	0.33168E-04	0.84346E-02	0.55462E-04	458.054	6873.48	0.84107E 06
2.50E 04	0.84306E-02	0.29574E-03	0.29574E-04	0.87016E-02	0.57063E-04	473.605	7204.96	0.86969E 06
2.55E 04	0.87449E-02	0.23803E-03	0.26558E-04	0.89829E-02	0.58778E-04	489.362	7560.68	0.89869E 06
2.60E 04	0.90663E-02	0.21074E-03	0.24009E-04	0.92770E-02	0.60594E-04	505.324	7939.63	0.92805E 06
2.65E 04	0.93950E-02	0.18782E-03	0.21839E-04	0.95828E-02	0.62500E-04	521.489	8341.08	0.95778E 06
2.70E 04	0.97309E-02	0.16841E-03	0.19978E-04	0.98993E-02	0.64490E-04	537.856	8764.53	0.98788E 06
2.75E 04	0.10074E-01	0.15185E-03	0.18370E-04	0.10226E-01	0.66556E-04	554.424	9209.63	0.10183E 07
2.80E 04	0.10424E-01	0.13763E-03	0.16973E-04	0.10562E-01	0.68694E-04	571.191	9676.18	0.10492E 07
2.85E 04	0.10782E-01	0.12533E-03	0.15749E-04	0.10907E-01	0.70899E-04	588.157	10164.1	0.10804E 07
2.90E 04	0.11146E-01	0.11463E-03	0.14672E-04	0.11261E-01	0.73168E-04	605.319	10673.4	0.11119E 07
2.95E 04	0.11518E-01	0.10525E-03	0.13718E-04	0.11623E-01	0.75499E-04	622.678	11204.1	0.11438E 07
3.00E 04	0.11897E-01	0.96991E-04	0.12868E-04	0.11994E-01	0.77890E-04	640.232	11756.3	0.11761E 07
3.05E 04	0.12282E-01	0.89676E-04	0.12107E-04	0.12372E-01	0.80339E-04	657.980	12330.3	0.12087E 07
3.10E 04	0.12674E-01	0.83166E-04	0.11422E-04	0.12759E-01	0.82844E-04	675.921	12926.2	0.12417E 07
3.15E 04	0.13070E-01	0.77343E-04	0.10503E-04	0.13153E-01	0.85409E-04	694.053	13544.3	0.12750E 07
3.20E 04	0.13483E-01	0.72113E-04	0.10241E-04	0.13555E-01	0.88021E-04	712.376	14184.8	0.13087E 07
3.25E 04	0.13898E-01	0.67395E-04	0.97280E-05	0.13965E-01	0.90690E-04	730.889	14848.1	0.13427E 07
3.30E 04	0.14320E-01	0.63124E-04	0.92586E-05	0.14383E-01	0.93413E-04	749.591	15534.4	0.13771E 07
3.35E 04	0.14749E-01	0.59243E-04	0.88274E-05	0.14808E-01	0.96189E-04	768.480	16244.1	0.14118E 07
3.40E 04	0.15185E-01	0.55704E-04	0.84299E-05	0.15241E-01	0.99017E-04	787.556	16977.5	0.14468E 07
3.45E 04	0.15629E-01	0.52467E-04	0.80623E-05	0.15681E-01	0.10190E-03	806.819	17734.9	0.14822E 07
3.50E 04	0.16079E-01	0.49495E-04	0.77214E-05	0.16129E-01	0.10483E-03	826.266	18516.8	0.15180E 07
3.55E 04	0.16533E-01	0.46766E-04	0.74044E-05	0.16584E-01	0.10781E-03	845.898	19323.5	0.15540E 07
3.60E 04	0.17003E-01	0.44250E-04	0.71088E-05	0.17047E-01	0.11085E-03	865.712	20155.3	0.15905E 07
3.65E 04	0.17476E-01	0.41723E-04	0.68326E-05	0.17517E-01	0.11394E-03	885.710	21012.7	0.16272E 07
3.70E 04	0.17956E-01	0.39768E-04	0.65739E-05	0.17995E-01	0.11708E-03	905.888	21896.1	0.16643E 07
3.75E 04	0.18443E-01	0.37767E-04	0.63311E-05	0.18481E-01	0.12027E-03	926.248	22805.8	0.17017E 07
3.80E 04	0.18938E-01	0.35906E-04	0.61027E-05	0.18974E-01	0.12351E-03	946.787	23742.2	0.17394E 07
3.85E 04	0.19440E-01	0.34173E-04	0.58876E-05	0.19474E-01	0.12680E-03	967.506	24705.8	0.17775E 07
3.90E 04	0.19950E-01	0.32554E-04	0.56845E-05	0.19982E-01	0.13014E-03	988.403	25697.0	0.18159E 07
3.95E 04	0.20467E-01	0.31042E-04	0.54927E-05	0.20498E-01	0.13354E-03	1009.49	26716.1	0.18546E 07
4.00E 04	0.20992E-01	0.29625E-04	0.53110E-05	0.21021E-01	0.13699E-03	1030.73	27763.7	0.18937E 07
4.05E 04	0.21524E-01	0.28297E-04	0.51388E-05	0.21552E-01	0.14049E-03	1052.16	28840.0	0.19330E 07

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(f) Continued. Pressure,  $10^0$  atmosphere

Temperature, °K	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec			Shielded coulombic collision cross sections, Å <sup>2</sup>		Dimensionless parameters for shielded coulombic collisions		
T	D <sub>H<sup>+</sup>-H</sub>	D <sub>e-H</sub>	D <sub>e-H<sup>+</sup></sub>	$\bar{\Omega}_c^{(1,1)}$	$\bar{\Omega}_c^{(2,2)}$	A <sub>c</sub> *	B <sub>c</sub> *	C <sub>c</sub> *
5.00E C3	33.8071	4094.35	4094.29	3275.88	3555.11	1.08524	1.05677	0.39016
5.50E C3	35.5085	4912.76	4912.53	2436.98	2667.75	1.09469	1.06307	0.39646
6.00E C3	45.5449	5768.04	5767.26	1862.49	2056.40	1.10411	1.06934	0.40274
6.50E C3	51.5083	6604.80	6602.70	1456.33	1621.56	1.11345	1.07556	0.40897
7.00E C3	58.5023	7343.68	7338.94	1161.35	1303.81	1.12267	1.08170	0.41511
7.50E C3	65.5535	7901.28	7892.06	942.090	1066.19	1.13173	1.08773	0.42115
8.00E C3	72.8106	8215.74	8199.88	775.826	884.901	1.14059	1.09363	0.42706
8.50E C3	80.3457	8261.08	8236.40	647.531	744.150	1.14921	1.09938	0.43281
9.00E C3	86.1545	8051.16	8015.75	547.015	633.197	1.15755	1.10493	0.43837
9.50E C3	96.2372	7636.67	7589.39	467.209	544.558	1.16556	1.11026	0.44370
1.00E C4	104.558	7090.69	7030.05	403.107	472.915	1.17317	1.11533	0.44878
1.05E C4	113.243	6487.07	6412.97	351.101	414.419	1.18034	1.12011	0.45356
1.10E C4	122.178	5834.00	5796.40	308.545	366.237	1.18698	1.12453	0.45799
1.15E C4	131.407	5318.84	5217.87	273.469	326.254	1.19302	1.12855	0.46201
1.20E C4	140.927	4810.97	4696.87	244.387	292.865	1.19836	1.13211	0.46558
1.25E C4	150.729	4367.67	4240.68	220.161	264.838	1.20293	1.13515	0.46862
1.30E C4	160.804	3989.50	3849.82	199.906	241.212	1.20663	1.13762	0.47109
1.35E C4	171.142	3673.97	3521.78	182.923	221.226	1.20946	1.13946	0.47293
1.40E C4	181.735	3417.80	3253.25	168.651	204.267	1.21118	1.14065	0.47412
1.45E C4	192.578	3217.87	3041.07	156.628	189.830	1.21198	1.14118	0.47466
1.50E C4	203.665	3071.48	2882.51	146.467	177.493	1.21183	1.14108	0.47455
1.55E C4	214.993	2876.09	2715.80	137.839	166.895	1.21080	1.14039	0.47387
1.60E C4	226.560	2628.97	2526.96	130.457	157.726	1.20902	1.13921	0.47268
1.65E C4	238.363	2382.96	2301.70	124.078	149.720	1.20665	1.13763	0.47110
1.70E C4	250.400	2166.39	2092.02	118.499	142.654	1.20384	1.13576	0.46923
1.75E C4	262.665	2043.27	1933.75	113.550	136.345	1.20074	1.13369	0.46716
1.80E C4	275.168	1913.64	1801.89	109.132	130.648	1.19748	1.13152	0.46499
1.85E C4	287.896	1783.80	1670.72	105.053	125.449	1.19416	1.12931	0.46277
1.90E C4	300.851	1660.53	1547.00	101.326	120.663	1.19084	1.12710	0.46056
1.95E C4	314.031	1551.15	1432.06	97.8647	116.223	1.18759	1.12493	0.45839
2.00E C4	327.433	1453.54	1327.75	94.6278	112.080	1.18443	1.12283	0.45629
2.05E C4	341.057	1366.09	1234.45	91.5837	108.195	1.18138	1.12080	0.45425
2.10E C4	354.901	1288.58	1150.94	88.7086	104.538	1.17844	1.11884	0.45230
2.15E C4	368.962	1217.15	1076.36	85.9841	101.086	1.17563	1.11697	0.45042
2.20E C4	383.240	1150.20	1010.10	83.3957	97.8189	1.17295	1.11518	0.44863
2.25E C4	397.732	1088.36	952.80	80.9316	94.7208	1.17038	1.11347	0.44692
2.30E C4	412.438	1032.40	903.23	78.5820	91.7782	1.16793	1.11184	0.44529
2.35E C4	427.355	981.24	860.30	76.3384	88.9791	1.16559	1.11028	0.44372
2.40E C4	442.483	933.89	820.03	74.1938	86.3132	1.16335	1.10879	0.44223
2.45E C4	457.819	889.44	781.50	72.1417	83.7715	1.16121	1.10736	0.44081
2.50E C4	473.362	847.03	745.87	70.1765	81.3458	1.15916	1.10600	0.43944
2.55E C4	489.111	806.86	712.34	68.2930	79.0285	1.15720	1.10469	0.43813
2.60E C4	505.065	768.16	680.14	66.4865	76.8131	1.15532	1.10344	0.43688
2.65E C4	521.222	731.20	649.54	64.7528	74.6934	1.15352	1.10224	0.43568
2.70E C4	537.581	695.82	620.82	63.0879	72.6638	1.15179	1.10109	0.43452
2.75E C4	554.140	661.84	593.29	61.4882	70.7190	1.15012	1.09998	0.43342
2.80E C4	570.900	629.67	566.97	59.9502	68.8542	1.14852	1.09892	0.43235
2.85E C4	587.857	600.19	542.07	58.4707	67.0651	1.14699	1.09789	0.43132
2.90E C4	605.012	573.40	518.62	57.0469	65.3475	1.14550	1.09691	0.43034
2.95E C4	622.362	548.80	495.68	55.6760	63.6976	1.14408	1.09595	0.42938
3.00E C4	639.908	526.21	473.33	54.3553	62.1117	1.14270	1.09504	0.42847
3.05E C4	657.647	504.65	451.62	53.0823	60.5866	1.14137	1.09415	0.42758
3.10E C4	675.579	484.11	430.57	51.8550	59.1191	1.14008	1.09330	0.42672
3.15E C4	693.703	464.59	410.04	50.6709	57.7063	1.13884	1.09247	0.42590
3.20E C4	712.017	446.00	390.02	49.5283	56.3454	1.13764	1.09167	0.42512
3.25E C4	730.521	428.45	370.51	48.4250	55.0340	1.13648	1.09090	0.42432
3.30E C4	749.214	411.94	351.52	47.3594	53.7696	1.13535	1.09015	0.42357
3.35E C4	768.095	396.47	333.07	46.3296	52.5500	1.13426	1.08942	0.42284
3.40E C4	787.162	381.03	315.17	45.3342	51.3730	1.13320	1.08871	0.42214
3.45E C4	806.416	366.61	297.82	44.3716	50.2366	1.13218	1.08803	0.42145
3.50E C4	825.854	353.23	281.03	43.4404	49.1390	1.13118	1.08737	0.42079
3.55E C4	845.477	340.88	264.79	42.5391	48.0784	1.13021	1.08672	0.42014
3.60E C4	865.283	329.56	249.10	41.6666	47.0530	1.12927	1.08610	0.41952
3.65E C4	885.271	319.27	233.94	40.8216	46.0614	1.12836	1.08549	0.41891
3.70E C4	905.440	309.99	219.32	40.0029	45.1021	1.12747	1.08490	0.41831
3.75E C4	925.781	301.70	205.15	39.2095	44.1736	1.12661	1.08432	0.41774
3.80E C4	946.301	294.34	191.43	38.4403	43.2746	1.12576	1.08376	0.41717
3.85E C4	967.001	287.99	178.15	37.6943	42.4039	1.12494	1.08321	0.41663
3.90E C4	987.879	282.65	165.30	36.9706	41.5602	1.12414	1.08268	0.41609
3.95E C4	1008.93	278.32	152.89	36.2683	40.7425	1.12336	1.08216	0.41557
4.00E C4	1030.13	284.00	140.92	35.5866	39.9496	1.12260	1.08165	0.41507
4.05E C4	1051.44	292.30	129.49	34.9246	39.1805	1.12186	1.08116	0.41457



TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(f) Concluded. Pressure,  $10^0$  atmosphere

Temperature, °K	Pure gas thermal conductivity, cal/(cm)(sec)(°K)		Pure gas viscosity, g/(cm)(sec)		Binary mixture thermal conductivity parameter, cal (cm)(sec)(°K)	Viscosity parameter, g/(cm)(sec)	Electrical conductivity second ap- proximation parameter	Electrical conductivity, mhos/m
T	$\lambda_{H^+}$	$\lambda_e$	$\eta_{H^+}$	$\eta_e$	$\lambda_{H^+-e}$	$\eta_{H^+-e}$	$\Delta_e$	$\sigma$
5.00E-03	0.39906E-05	0.16893E-03	0.53304E-06	0.12434E-07	0.11948E-03	0.17585E-07	0.73816E-03	0.89875
5.50E-03	0.55076E-05	0.23610E-03	0.74501E-06	0.17379E-07	0.16700E-03	0.24577E-07	0.19107E-03	4.23214
6.00E-03	0.74627E-05	0.31992E-03	0.10095E-05	0.23548E-07	0.22628E-03	0.33302E-07	0.22237E-04	15.4248
6.50E-03	0.98903E-05	0.42227E-03	0.13325E-05	0.31082E-07	0.29867E-03	0.43957E-07	0.10719E-02	45.7241
7.00E-03	0.12713E-04	0.54501E-03	0.17197E-05	0.40116E-07	0.38548E-03	0.56733E-07	0.54655E-02	113.902
7.50E-03	0.16092E-04	0.69986E-03	0.21768E-05	0.50779E-07	0.48794E-03	0.71812E-07	0.16536E-01	244.159
8.00E-03	0.20025E-04	0.85846E-03	0.27088E-05	0.63188E-07	0.60719E-03	0.89362E-07	0.36896E-01	459.469
8.50E-03	0.24546E-04	0.10522E-02	0.33203E-05	0.77452E-07	0.74425E-03	0.10953E-06	0.65817E-01	773.167
9.00E-03	0.29682E-04	0.12725E-02	0.40152E-05	0.93663E-07	0.90002E-03	0.13246E-06	0.99074E-01	1183.59
9.50E-03	0.35600E-04	0.15201E-02	0.47957E-05	0.11189E-06	0.10752E-02	0.15824E-06	0.13156	1675.04
1.00E-04	0.41653E-04	0.17959E-02	0.56669E-05	0.13219E-06	0.12702E-02	0.18695E-06	0.15975	2224.29
1.05E-04	0.46987E-04	0.21003E-02	0.66265E-05	0.15458E-06	0.14853E-02	0.21860E-06	0.18226	2808.08
1.10E-04	0.52676E-04	0.24422E-02	0.76747E-05	0.17903E-06	0.17203E-02	0.25318E-06	0.19928	3407.77
1.15E-04	0.58521E-04	0.27917E-02	0.88089E-05	0.20548E-06	0.19745E-02	0.29060E-06	0.21171	4010.28
1.20E-04	0.64185E-04	0.31768E-02	0.10024E-04	0.23383E-06	0.22470E-02	0.33069E-06	0.22066	4607.01
1.25E-04	0.69637E-04	0.35854E-02	0.11314E-04	0.26391E-06	0.25360E-02	0.37323E-06	0.22712	5192.03
1.30E-04	0.75648E-04	0.40146E-02	0.12668E-04	0.29550E-06	0.28395E-02	0.41790E-06	0.23193	5760.77
1.35E-04	0.81405E-04	0.44607E-02	0.14075E-04	0.32833E-06	0.31550E-02	0.46433E-06	0.23573	6309.16
1.40E-04	0.87176E-04	0.49197E-02	0.15524E-04	0.36212E-06	0.34797E-02	0.51211E-06	0.23900	6833.49
1.45E-04	0.92876E-04	0.53875E-02	0.17000E-04	0.39556E-06	0.38106E-02	0.56082E-06	0.24208	7330.49
1.50E-04	0.98571E-04	0.58605E-02	0.18492E-04	0.43137E-06	0.41451E-02	0.61005E-06	0.24517	7797.85
1.55E-04	0.10479E-03	0.63356E-02	0.19992E-04	0.46635E-06	0.44812E-02	0.65951E-06	0.24839	8234.60
1.60E-04	0.10989E-03	0.68112E-02	0.21492E-04	0.50135E-06	0.48176E-02	0.70902E-06	0.25177	8641.44
1.65E-04	0.11695E-03	0.72867E-02	0.22993E-04	0.53635E-06	0.51539E-02	0.75851E-06	0.25530	9020.63
1.70E-04	0.12410E-03	0.77627E-02	0.24495E-04	0.57138E-06	0.54905E-02	0.80806E-06	0.25893	9375.65
1.75E-04	0.13222E-03	0.82404E-02	0.26002E-04	0.60655E-06	0.58284E-02	0.85779E-06	0.26259	9710.57
1.80E-04	0.14034E-03	0.87217E-02	0.27521E-04	0.64198E-06	0.61689E-02	0.90789E-06	0.26623	10029.5
1.85E-04	0.14848E-03	0.92084E-02	0.29057E-04	0.67780E-06	0.65131E-02	0.95856E-06	0.26980	10336.3
1.90E-04	0.15663E-03	0.97022E-02	0.30615E-04	0.71415E-06	0.68624E-02	0.10100E-05	0.27328	10634.1
1.95E-04	0.16478E-03	0.10205E-01	0.32200E-04	0.75112E-06	0.72177E-02	0.10622E-05	0.27663	10925.4
2.00E-04	0.17293E-03	0.10717E-01	0.33815E-04	0.78881E-06	0.75798E-02	0.11155E-05	0.27985	11212.4
2.05E-04	0.18108E-03	0.11239E-01	0.35465E-04	0.82729E-06	0.79495E-02	0.11700E-05	0.28294	11496.5
2.10E-04	0.18923E-03	0.11773E-01	0.37150E-04	0.86660E-06	0.83273E-02	0.12256E-05	0.28589	11778.8
2.15E-04	0.19738E-03	0.12320E-01	0.38874E-04	0.90681E-06	0.87136E-02	0.12824E-05	0.28870	12060.1
2.20E-04	0.20553E-03	0.12878E-01	0.40637E-04	0.94793E-06	0.91088E-02	0.13406E-05	0.29139	12341.1
2.25E-04	0.21368E-03	0.13450E-01	0.42440E-04	0.98999E-06	0.95130E-02	0.14001E-05	0.29396	12622.4
2.30E-04	0.22183E-03	0.14034E-01	0.44285E-04	0.10330E-05	0.99265E-02	0.14609E-05	0.29641	12904.0
2.35E-04	0.23008E-03	0.14632E-01	0.46171E-04	0.10770E-05	0.10349E-01	0.15232E-05	0.29876	13186.3
2.40E-04	0.23833E-03	0.15244E-01	0.48101E-04	0.11221E-05	0.10782E-01	0.15868E-05	0.30100	13469.5
2.45E-04	0.24658E-03	0.15869E-01	0.50074E-04	0.11681E-05	0.11224E-01	0.16519E-05	0.30315	13753.6
2.50E-04	0.25483E-03	0.16503E-01	0.52091E-04	0.12151E-05	0.11676E-01	0.17184E-05	0.30520	14038.8
2.55E-04	0.26308E-03	0.17161E-01	0.54152E-04	0.12632E-05	0.12138E-01	0.17864E-05	0.30718	14325.2
2.60E-04	0.27133E-03	0.17829E-01	0.56297E-04	0.13123E-05	0.12610E-01	0.18559E-05	0.30907	14612.7
2.65E-04	0.27958E-03	0.18510E-01	0.58467E-04	0.13625E-05	0.13092E-01	0.19268E-05	0.31089	14901.4
2.70E-04	0.28783E-03	0.19206E-01	0.60603E-04	0.14137E-05	0.13584E-01	0.19992E-05	0.31264	15191.4
2.75E-04	0.29608E-03	0.19916E-01	0.62843E-04	0.14659E-05	0.14086E-01	0.20732E-05	0.31432	15482.6
2.80E-04	0.30433E-03	0.20640E-01	0.65129E-04	0.15193E-05	0.14599E-01	0.21485E-05	0.31595	15775.0
2.85E-04	0.31258E-03	0.21379E-01	0.67461E-04	0.15737E-05	0.15122E-01	0.22255E-05	0.31751	16068.6
2.90E-04	0.32083E-03	0.22133E-01	0.69839E-04	0.16291E-05	0.15655E-01	0.23039E-05	0.31902	16363.5
2.95E-04	0.32908E-03	0.22901E-01	0.72263E-04	0.16857E-05	0.16198E-01	0.23839E-05	0.32048	16659.5
3.00E-04	0.33733E-03	0.23664E-01	0.74733E-04	0.17433E-05	0.16752E-01	0.24654E-05	0.32188	16956.8
3.05E-04	0.34558E-03	0.24482E-01	0.77251E-04	0.18020E-05	0.17316E-01	0.25484E-05	0.32324	17255.3
3.10E-04	0.35383E-03	0.25294E-01	0.79814E-04	0.18618E-05	0.17891E-01	0.26330E-05	0.32456	17555.0
3.15E-04	0.36208E-03	0.26122E-01	0.82425E-04	0.19227E-05	0.18476E-01	0.27191E-05	0.32588	17855.9
3.20E-04	0.37033E-03	0.26946E-01	0.85083E-04	0.19847E-05	0.19072E-01	0.28068E-05	0.32707	18158.0
3.25E-04	0.37858E-03	0.27789E-01	0.87789E-04	0.20478E-05	0.19678E-01	0.28961E-05	0.32826	18461.2
3.30E-04	0.38683E-03	0.28694E-01	0.90541E-04	0.21121E-05	0.20295E-01	0.29869E-05	0.32942	18765.6
3.35E-04	0.39508E-03	0.29581E-01	0.93342E-04	0.21774E-05	0.20942E-01	0.30793E-05	0.33055	19071.1
3.40E-04	0.40333E-03	0.30484E-01	0.96191E-04	0.22438E-05	0.21561E-01	0.31733E-05	0.33164	19377.7
3.45E-04	0.41158E-03	0.31402E-01	0.99087E-04	0.23114E-05	0.22211E-01	0.32688E-05	0.33271	19685.5
3.50E-04	0.41983E-03	0.32335E-01	0.10203E-03	0.23801E-05	0.22871E-01	0.33660E-05	0.33374	19994.3
3.55E-04	0.42808E-03	0.33284E-01	0.10502E-03	0.24499E-05	0.23542E-01	0.34647E-05	0.33474	20304.3
3.60E-04	0.43633E-03	0.34248E-01	0.10807E-03	0.25209E-05	0.24223E-01	0.35650E-05	0.33572	20615.4
3.65E-04	0.44458E-03	0.35227E-01	0.11116E-03	0.25930E-05	0.24918E-01	0.36670E-05	0.33667	20927.5
3.70E-04	0.45283E-03	0.36222E-01	0.11430E-03	0.26662E-05	0.25620E-01	0.37706E-05	0.33760	21240.7
3.75E-04	0.46108E-03	0.37232E-01	0.11748E-03	0.27406E-05	0.26334E-01	0.38757E-05	0.33850	21555.0
3.80E-04	0.46933E-03	0.38258E-01	0.12072E-03	0.28161E-05	0.27060E-01	0.39825E-05	0.33938	21870.3
3.85E-04	0.47758E-03	0.39300E-01	0.12401E-03	0.28927E-05	0.27797E-01	0.40910E-05	0.34023	22186.6
3.90E-04	0.48583E-03	0.40357E-01	0.12735E-03	0.29706E-05	0.28545E-01	0.42010E-05	0.34107	22504.0
3.95E-04	0.49408E-03	0.41433E-01	0.13073E-03	0.30496E-05	0.29304E-01	0.43127E-05	0.34188	22822.4
4.00E-04	0.50233E-03	0.42515E-01	0.13417E-03	0.31297E-05	0.30074E-01	0.44261E-05	0.34268	23141.8
4.05E-04	0.51058E-03	0.43624E-01	0.13765E-03	0.32110E-05	0.30855E-01	0.45411E-05	0.34346	23462.2

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(g) Pressure,  $10^1$  atmospheres

Temperature, °K	Mole fractions		Binary diffusion coefficients, cm <sup>2</sup> /sec			Thermal diffusion coefficients, g/(cm)(sec)		
T	x <sub>H</sub>	x <sub>H<sup>+</sup></sub>	D <sub>H-H<sup>+</sup></sub>	D <sub>H<sup>+</sup>-e</sub>	D <sub>H-e</sub>	D <sub>H</sub> <sup>T</sup>	D <sub>H<sup>+</sup></sub> <sup>T</sup>	D <sub>e</sub> <sup>T</sup>
5.00E 03	1.00000	0.10794E-05	8.07280	1.60396	1150.14	-0.39071E-10	0.39341E-10	-0.26978E-12
5.50E 03	0.99999	0.50957E-05	9.49413	2.51692	1376.48	-0.19507E-09	0.19594E-09	-0.87263E-12
6.00E 03	0.99996	0.18777E-04	11.0054	3.79788	1622.68	-0.75197E-09	0.75315E-09	-0.11724E-11
6.50E 03	0.99985	0.57028E-04	12.5970	5.54430	1887.49	-0.23634E-08	0.23581E-08	-0.53106E-11
7.00E 03	0.99970	0.14880E-03	14.2542	7.86752	2168.57	-0.62905E-08	0.62435E-08	-0.47035E-10
7.50E 03	0.99951	0.34363E-03	15.9568	10.8928	2462.14	-0.14596E-07	0.14383E-07	-0.21379E-09
8.00E 03	0.99886	0.71835E-03	17.6796	14.7592	2762.97	-0.30309E-07	0.29583E-07	-0.72552E-09
8.50E 03	0.99723	0.13828E-02	19.3945	19.6189	3064.62	-0.57878E-07	0.55869E-07	-0.20093E-08
9.00E 03	0.99563	0.24838E-02	21.0757	25.6359	3360.12	-0.10460E-06	0.99868E-07	-0.47280E-08
9.50E 03	0.99159	0.42070E-02	22.7040	32.9847	3642.86	-0.18335E-06	0.17365E-06	-0.97067E-08
1.00E 04	0.98645	0.67751E-02	24.2736	41.8478	3907.57	-0.31601E-06	0.29825E-06	-0.17762E-07
1.05E 04	0.97911	0.10443E-01	25.7961	52.4117	4151.02	-0.53542E-06	0.50589E-06	-0.29529E-07
1.10E 04	0.96902	0.15491E-01	27.3021	64.8632	4372.23	-0.88364E-06	0.83830E-06	-0.45335E-07
1.15E 04	0.95559	0.22207E-01	28.8402	79.3832	4572.33	-0.14049E-05	0.13397E-05	-0.65200E-07
1.20E 04	0.93824	0.30878E-01	30.4716	96.1397	4753.94	-0.21332E-05	0.20443E-05	-0.88900E-07
1.25E 04	0.91647	0.41763E-01	32.2620	115.280	4920.59	-0.30789E-05	0.29628E-05	-0.11607E-06
1.30E 04	0.88985	0.55075E-01	34.2726	136.922	5076.12	-0.42176E-05	0.40713E-05	-0.14627E-06
1.35E 04	0.85809	0.70954E-01	36.5504	161.143	5224.26	-0.54891E-05	0.53100E-05	-0.17911E-06
1.40E 04	0.82111	0.89446E-01	39.1223	187.976	5368.45	-0.68071E-05	0.65929E-05	-0.21421E-06
1.45E 04	0.77904	0.11048	41.9929	217.395	5511.77	-0.80747E-05	0.78234E-05	-0.25127E-06
1.50E 04	0.73230	0.13385	45.1457	249.320	5656.99	-0.92022E-05	0.89121E-05	-0.29005E-06
1.55E 04	0.68155	0.15923	48.5492	283.609	5806.70	-0.10119E-04	0.97885E-05	-0.33040E-06
1.60E 04	0.62772	0.18614	52.1624	320.070	5963.38	-0.10779E-04	0.10407E-04	-0.37220E-06
1.65E 04	0.57195	0.21403	55.9420	358.469	6129.49	-0.11161E-04	0.10746E-04	-0.41538E-06
1.70E 04	0.51552	0.24224	59.8471	398.559	6307.49	-0.11266E-04	0.10806E-04	-0.45989E-06
1.75E 04	0.45975	0.27012	63.8425	440.056	6499.81	-0.11114E-04	0.10609E-04	-0.50568E-06
1.80E 04	0.40542	0.29704	68.7999	482.575	6708.71	-0.10738E-04	0.10186E-04	-0.55271E-06
1.85E 04	0.35512	0.32244	71.9987	526.443	6936.20	-0.10182E-04	0.95811E-05	-0.60091E-06
1.90E 04	0.30819	0.34590	76.1252	570.994	7183.89	-0.94936E-05	0.88434E-05	-0.65022E-06
1.95E 04	0.26572	0.36714	80.2715	616.333	7452.85	-0.87223E-05	0.80217E-05	-0.70057E-06
2.00E 04	0.22786	0.38602	84.4343	662.451	7743.55	-0.79136E-05	0.71617E-05	-0.75191E-06
2.05E 04	0.19491	0.40254	88.6141	709.397	8055.93	-0.71060E-05	0.63018E-05	-0.80418E-06
2.10E 04	0.16638	0.41681	92.8132	757.261	8389.42	-0.63293E-05	0.54720E-05	-0.85734E-06
2.15E 04	0.14200	0.42900	97.0358	806.161	8743.08	-0.56040E-05	0.46927E-05	-0.91137E-06
2.20E 04	0.12134	0.43933	101.286	856.232	9115.74	-0.49422E-05	0.39759E-05	-0.96628E-06
2.25E 04	0.10353	0.44803	105.570	907.614	9506.15	-0.43490E-05	0.32697E-05	-0.10221E-05
2.30E 04	0.8951E-01	0.45534	109.896	960.446	9913.01	-0.38244E-05	0.27456E-05	-0.10787E-05
2.35E 04	0.77077E-01	0.46146	114.252	1014.86	10335.01	-0.33650E-05	0.22287E-05	-0.11363E-05
2.40E 04	0.66825E-01	0.46659	118.659	1070.97	10771.3	-0.29656E-05	0.17707E-05	-0.11949E-05
2.45E 04	0.58228E-01	0.47089	123.114	1128.90	11220.6	-0.26198E-05	0.13653E-05	-0.12545E-05
2.50E 04	0.51068E-01	0.47450	127.620	1188.74	11682.1	-0.23211E-05	0.10061E-05	-0.13150E-05
2.55E 04	0.44927E-01	0.47754	132.179	1250.59	12155.0	-0.20634E-05	0.68673E-06	-0.13767E-05
2.60E 04	0.39760E-01	0.48011	136.793	1314.54	12638.5	-0.18409E-05	0.40152E-06	-0.14394E-05
2.65E 04	0.35430E-01	0.48229	141.463	1380.65	13132.1	-0.16485E-05	0.14531E-06	-0.15032E-05
2.70E 04	0.31717E-01	0.48414	146.191	1449.01	13635.1	-0.14818E-05	-0.86386E-07	-0.15682E-05
2.75E 04	0.28541E-01	0.48573	150.977	1519.68	14147.0	-0.13369E-05	-0.29744E-06	-0.16344E-05
2.80E 04	0.25812E-01	0.48705	155.821	1592.72	14667.2	-0.12105E-05	-0.49116E-06	-0.17017E-05
2.85E 04	0.23455E-01	0.48827	160.776	1668.19	15195.3	-0.10999E-05	-0.67037E-06	-0.17703E-05
2.90E 04	0.21412E-01	0.48925	165.690	1746.16	15730.9	-0.10026E-05	-0.83742E-06	-0.18401E-05
2.95E 04	0.19632E-01	0.49018	170.715	1826.68	16273.4	-0.91679E-06	-0.99434E-06	-0.19111E-05
3.00E 04	0.18074E-01	0.49096	175.800	1909.80	16822.4	-0.84064E-06	-0.11428E-05	-0.19834E-05
3.05E 04	0.16704E-01	0.49165	180.945	1995.58	17377.5	-0.77282E-06	-0.12842E-05	-0.20571E-05
3.10E 04	0.15455E-01	0.49225	186.151	2084.07	17938.7	-0.71212E-06	-0.14198E-05	-0.21320E-05
3.15E 04	0.14422E-01	0.49279	191.418	2175.32	18504.4	-0.65755E-06	-0.15506E-05	-0.22082E-05
3.20E 04	0.13467E-01	0.49327	196.746	2269.30	19075.2	-0.60826E-06	-0.16775E-05	-0.22857E-05
3.25E 04	0.12613E-01	0.49365	202.134	2366.30	19650.5	-0.56353E-06	-0.18011E-05	-0.23646E-05
3.30E 04	0.11847E-01	0.49408	207.583	2466.14	20229.8	-0.52277E-06	-0.19220E-05	-0.24448E-05
3.35E 04	0.11155E-01	0.49442	213.092	2568.94	20812.6	-0.48545E-06	-0.20409E-05	-0.25264E-05
3.40E 04	0.10532E-01	0.49473	218.661	2674.75	21398.7	-0.45113E-06	-0.21582E-05	-0.26093E-05
3.45E 04	0.99650E-02	0.49502	224.290	2783.62	21987.5	-0.41944E-06	-0.22742E-05	-0.26936E-05
3.50E 04	0.94491E-02	0.49528	229.980	2895.61	22578.6	-0.39005E-06	-0.23893E-05	-0.27793E-05
3.55E 04	0.89780E-02	0.49551	235.729	3010.75	23171.8	-0.36269E-06	-0.25037E-05	-0.28664E-05
3.60E 04	0.85463E-02	0.49573	241.538	3129.11	23766.4	-0.33711E-06	-0.26178E-05	-0.29549E-05
3.65E 04	0.81457E-02	0.49593	247.407	3250.73	24362.3	-0.31312E-06	-0.27317E-05	-0.30448E-05
3.70E 04	0.77842E-02	0.49611	253.335	3375.45	24958.9	-0.29052E-06	-0.28456E-05	-0.31361E-05
3.75E 04	0.74605E-02	0.49628	259.322	3503.94	25555.9	-0.26916E-06	-0.29597E-05	-0.32289E-05
3.80E 04	0.71338E-02	0.49643	265.368	3635.63	26153.0	-0.24892E-06	-0.30741E-05	-0.33239E-05
3.85E 04	0.68434E-02	0.49658	271.473	3770.78	26749.7	-0.22966E-06	-0.31889E-05	-0.34186E-05
3.90E 04	0.65732E-02	0.49671	277.636	3909.44	27345.6	-0.21127E-06	-0.33043E-05	-0.35156E-05
3.95E 04	0.63211E-02	0.49684	283.859	4051.66	27940.5	-0.19371E-06	-0.34204E-05	-0.36141E-05
4.00E 04	0.60855E-02	0.49696	290.139	4197.49	28534.0	-0.17684E-06	-0.35372E-05	-0.37140E-05
4.05E 04	0.58649E-02	0.49707	296.478	4346.97	29125.7	-0.16001E-06	-0.36548E-05	-0.38154E-05

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(g) Continued. Pressure,  $10^1$  atmospheres

Temperature, °K	Thermal conductivity, cal/(cm)(sec)(°K)				Viscosity, g/(cm)(sec)	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec		
	Transla- tional	Reaction	Diffusional	Total		D <sub>H-H<sup>+</sup></sub>	D <sub>H<sup>+</sup>-e</sub>	D <sub>H-e</sub>
T	$\lambda_t$	$\lambda_r$	$\lambda_d$	$\lambda$	$\eta$	D <sub>H-H<sup>+</sup></sub>	D <sub>H<sup>+</sup>-e</sub>	D <sub>H-e</sub>
5.00E C3	0.41115E-C2	0.17448E-C6	-0.25415E-09	0.41117E-02	0.55614E-03	3.38075	6209.97	412.897
5.50E C3	0.44838E-C2	0.72394E-C6	-0.72556E-09	0.44845E-02	0.60640E-03	3.95083	7248.16	505.870
6.00E C3	0.48579E-C2	0.23676E-05	-0.87036E-09	0.48603E-02	0.65665E-03	4.55506	8330.01	625.047
6.50E C3	0.52371E-C2	0.64481E-C5	0.35618E-08	0.52436E-02	0.70689E-03	5.19232	9430.19	792.148
7.00E C3	0.56268E-C2	0.15238E-C4	0.28866E-07	0.56420E-02	0.75701E-03	5.86154	10509.5	1041.64
7.50E C3	0.60343E-C2	0.31967E-C4	0.12176E-06	0.60663E-02	0.80680E-03	6.56169	11516.4	1419.33
8.00E C3	0.64671E-C2	0.61186E-C4	0.38942E-06	0.65283E-02	0.85586E-03	7.29179	12393.6	1976.02
8.50E C3	0.69269E-C2	0.16840E-C3	0.10330E-05	0.70373E-02	0.90355E-03	8.05093	13088.2	2758.16
9.00E C3	0.74182E-C2	0.18002E-03	0.23663E-05	0.75982E-02	0.94884E-03	8.83834	13561.0	3799.46
9.50E C3	0.79276E-C2	0.28366E-03	0.48047E-05	0.82106E-02	0.99025E-03	9.65338	13791.4	5116.43
1.00E C4	0.84448E-C2	0.42469E-03	0.88268E-05	0.88695E-02	0.10257E-02	10.4956	13778.9	6707.25
1.05E C4	0.89534E-C2	0.61188E-C3	0.14928E-04	0.95653E-02	0.10527E-02	11.3645	13541.6	8553.26
1.10E C4	0.94527E-C2	0.85079E-C3	0.23581E-04	0.10283E-01	0.10682E-02	12.2601	13112.9	10622.5
1.15E C4	0.99519E-C2	0.11463E-02	0.35204E-04	0.11005E-01	0.10692E-02	13.1821	12535.0	12875.3
1.20E C4	0.10260E-C1	0.15013E-C2	0.50140E-04	0.11710E-01	0.10535E-02	14.1308	11852.6	15270.6
1.25E C4	0.10463E-C1	0.19164E-02	0.68628E-04	0.12379E-01	0.10201E-02	15.1060	11106.2	17771.2
1.30E C4	0.10611E-C1	0.23887E-C2	0.90770E-04	0.12999E-01	0.96996E-03	16.1079	10329.7	20346.3
1.35E C4	0.10850E-C1	0.29116E-C2	0.11650E-03	0.13568E-01	0.90593E-03	17.1363	9548.75	22972.8
1.40E C4	0.10614E-C1	0.34740E-C2	0.14554E-03	0.14088E-01	0.83206E-03	18.1911	8781.24	25634.2
1.45E C4	0.10508E-01	0.40600E-02	0.17737E-03	0.14568E-01	0.75292E-03	19.2718	8039.21	28319.2
1.50E C4	0.10369E-C1	0.46484E-02	0.21120E-03	0.15014E-01	0.67280E-03	20.3782	7330.34	31020.4
1.55E C4	0.10212E-C1	0.52137E-C2	0.24594E-03	0.15426E-01	0.59520E-03	21.5096	6659.49	33732.7
1.60E C4	0.10071E-C1	0.57265E-02	0.28022E-03	0.15797E-01	0.52259E-03	22.6657	6029.82	36452.7
1.65E C4	0.99562E-C2	0.61564E-02	0.31243E-03	0.16113E-01	0.45652E-03	23.8460	5443.54	39177.7
1.70E C4	0.98158E-C2	0.64748E-C2	0.34082E-03	0.16354E-01	0.39769E-03	25.0501	4902.26	41905.8
1.75E C4	0.96867E-C2	0.66586E-02	0.36367E-03	0.16505E-01	0.34625E-03	26.2777	4407.20	44635.5
1.80E C4	0.95593E-C2	0.66942E-C2	0.37952E-03	0.16554E-01	0.30194E-03	27.5284	3959.08	47365.6
1.85E C4	0.94168E-C2	0.65805E-02	0.38740E-03	0.16497E-01	0.26426E-03	28.8022	3558.00	50095.7
1.90E C4	0.10017E-C1	0.63253E-C2	0.38700E-03	0.16346E-01	0.23256E-03	30.0986	3203.34	52826.3
1.95E C4	0.10159E-C1	0.59646E-C2	0.37872E-03	0.16119E-01	0.20617E-03	31.4175	2893.68	55558.2
2.00E C4	0.10327E-C1	0.55155E-C2	0.36365E-03	0.15845E-01	0.18441E-03	32.7587	2626.81	58293.3
2.05E C4	0.10534E-C1	0.50175E-C2	0.34331E-03	0.15552E-01	0.16663E-03	34.1220	2399.86	61034.0
2.10E C4	0.10767E-C1	0.45015E-02	0.31941E-03	0.15268E-01	0.15224E-03	35.5073	2209.51	63783.2
2.15E C4	0.11024E-C1	0.39934E-C2	0.29360E-03	0.15017E-01	0.14070E-03	36.9144	2052.16	66543.8
2.20E C4	0.11302E-C1	0.35124E-C2	0.26733E-03	0.14815E-01	0.13155E-03	38.3430	1924.18	69319.0
2.25E C4	0.11601E-C1	0.30766E-C2	0.24167E-03	0.14671E-01	0.12439E-03	39.7931	1822.07	72111.7
2.30E C4	0.11916E-C1	0.26739E-02	0.21741E-03	0.14590E-01	0.11888E-03	41.2646	1742.55	74924.7
2.35E C4	0.12246E-C1	0.23239E-C2	0.19499E-03	0.14572E-01	0.11473E-03	42.7571	1682.69	77760.5
2.40E C4	0.12599E-C1	0.20189E-C2	0.17464E-03	0.14614E-01	0.11172E-03	44.2707	1639.87	80621.2
2.45E C4	0.12959E-C1	0.17556E-C2	0.15640E-03	0.14711E-01	0.10965E-03	45.8051	1611.84	83508.6
2.50E C4	0.13328E-C1	0.15296E-C2	0.14021E-03	0.14858E-01	0.10837E-03	47.3603	1596.67	86424.2
2.55E C4	0.13713E-C1	0.13363E-C2	0.12592E-03	0.15050E-01	0.10773E-03	48.9360	1592.73	89369.4
2.60E C4	0.14110E-C1	0.11712E-C2	0.11336E-03	0.15281E-01	0.10765E-03	50.5322	1598.64	92345.2
2.65E C4	0.14518E-C1	0.10364E-02	0.10234E-03	0.15548E-01	0.10804E-03	52.1488	1613.27	95352.4
2.70E C4	0.14936E-C1	0.91003E-03	0.92690E-04	0.15846E-01	0.10882E-03	53.7855	1635.65	98391.6
2.75E C4	0.15365E-C1	0.80899E-03	0.84231E-04	0.16172E-01	0.10994E-03	55.4423	1664.99	0.10146E 06
2.80E C4	0.15804E-C1	0.71860E-03	0.76808E-04	0.16523E-01	0.11135E-03	57.1190	1700.65	0.10457E 06
2.85E C4	0.16253E-C1	0.64255E-03	0.70284E-04	0.16895E-01	0.11302E-03	58.8156	1742.07	0.10771E 06
2.90E C4	0.16711E-C1	0.57688E-03	0.64537E-04	0.17288E-01	0.11491E-03	60.5319	1788.82	0.11088E 06
2.95E C4	0.17180E-C1	0.51998E-03	0.59461E-04	0.17700E-01	0.11700E-03	62.2679	1840.52	0.11408E 06
3.00E C4	0.17657E-C1	0.47050E-03	0.54964E-04	0.18128E-01	0.11927E-03	64.0233	1896.88	0.11732E 06
3.05E C4	0.18144E-C1	0.42725E-03	0.50969E-04	0.18571E-01	0.12170E-03	65.7980	1957.64	0.12060E 06
3.10E C4	0.18640E-C1	0.38943E-C3	0.47408E-04	0.19030E-01	0.12427E-03	67.5921	2022.60	0.12390E 06
3.15E C4	0.19140E-C1	0.35611E-C3	0.44224E-04	0.19502E-01	0.12697E-03	69.4054	2091.60	0.12724E 06
3.20E C4	0.19646E-C1	0.32669E-03	0.41368E-04	0.19987E-01	0.12980E-03	71.2377	2164.51	0.13062E 06
3.25E C4	0.20184E-C1	0.30061E-03	0.38797E-04	0.20485E-01	0.13274E-03	73.0890	2241.21	0.13403E 06
3.30E C4	0.20717E-C1	0.27740E-03	0.36475E-04	0.20994E-01	0.13579E-03	74.9592	2321.63	0.13747E 06
3.35E C4	0.21259E-C1	0.25668E-03	0.34372E-04	0.21515E-01	0.13893E-03	76.8481	2405.69	0.14095E 06
3.40E C4	0.21809E-C1	0.23811E-03	0.32462E-04	0.22047E-01	0.14217E-03	78.7558	2493.35	0.14446E 06
3.45E C4	0.22369E-C1	0.22142E-C3	0.30720E-04	0.22591E-01	0.14551E-03	80.6820	2584.58	0.14800E 06
3.50E C4	0.22938E-C1	0.20637E-C3	0.29128E-04	0.23144E-01	0.14893E-03	82.6268	2679.34	0.15158E 06
3.55E C4	0.23516E-C1	0.19275E-C3	0.27669E-04	0.23708E-01	0.15243E-03	84.5899	2777.62	0.15519E 06
3.60E C4	0.24102E-C1	0.18039E-C3	0.26328E-04	0.24282E-01	0.15601E-03	86.5714	2879.42	0.15883E 06
3.65E C4	0.24698E-C1	0.16915E-C3	0.25092E-04	0.24867E-01	0.15968E-03	88.5711	2984.73	0.16250E 06
3.70E C4	0.25302E-C1	0.15889E-C3	0.23950E-04	0.25461E-01	0.16342E-03	90.5890	3093.56	0.16621E 06
3.75E C4	0.25916E-C1	0.14956E-C3	0.22892E-04	0.26065E-01	0.16723E-03	92.6250	3205.93	0.16996E 06
3.80E C4	0.26538E-C1	0.14089E-C3	0.21911E-04	0.26679E-01	0.17112E-03	94.6789	3321.85	0.17373E 06
3.85E C4	0.27169E-C1	0.13298E-C3	0.20997E-04	0.27302E-01	0.17507E-03	96.7508	3441.34	0.17754E 06
3.90E C4	0.27810E-C1	0.12569E-03	0.20146E-04	0.27935E-01	0.17910E-03	98.8405	3564.42	0.18138E 06
3.95E C4	0.28459E-C1	0.11896E-03	0.19350E-04	0.28578E-01	0.18320E-03	100.948	3691.13	0.18525E 06
4.00E C4	0.29117E-C1	0.11274E-C3	0.18605E-04	0.29230E-01	0.18737E-03	103.073	3821.48	0.18915E 06
4.05E C4	0.29784E-C1	0.10697E-C3	0.17907E-04	0.29891E-01	0.19161E-03	105.216	3955.52	0.19309E 06

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN  
(g) Continued. Pressure,  $10^1$  atmospheres

Temperature, °K	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec			Shielded coulombic col- lision cross sections, $\frac{\sigma_0}{A}$		Dimensionless parameters for shielded coulombic collisions		
T	D <sub>H<sup>+</sup>-H</sub>	D <sub>e-H</sub>	D <sub>e-H<sup>+</sup></sub>	$\bar{\sigma}_c^{(1,1)}$	$\bar{\sigma}_c^{(2,2)}$	A <sub>c</sub> <sup>*</sup>	B <sub>c</sub> <sup>*</sup>	C <sub>c</sub> <sup>*</sup>
5.00E 03	3.38075	409.935	409.933	2954.40	3233.63	1.09451	1.06295	0.39634
5.50E 03	3.45022	493.442	493.435	2171.30	2402.07	1.10628	1.07078	0.40419
6.00E 03	4.55505	584.074	584.051	1639.23	1833.14	1.11829	1.07878	0.41220
6.50E 03	5.19229	680.272	680.211	1266.09	1431.32	1.13050	1.08691	0.42033
7.00E 03	5.88147	779.324	779.182	997.283	1139.75	1.14295	1.09514	0.42857
7.50E 03	6.56153	877.358	877.065	799.119	923.222	1.15530	1.10343	0.43687
8.00E 03	7.24149	969.738	969.195	650.079	759.154	1.16779	1.11175	0.44519
8.50E 03	8.05043	1051.76	1050.84	536.003	632.623	1.18026	1.12005	0.45351
9.00E 03	8.83750	1119.34	1117.90	447.329	533.512	1.19266	1.12831	0.46177
9.50E 03	9.65223	1169.58	1167.46	377.449	454.799	1.20493	1.13648	0.46995
1.00E 04	10.4939	1201.02	1198.07	321.707	391.515	1.21699	1.14452	0.47799
1.05E 04	11.3624	1213.81	1209.89	276.757	340.074	1.22879	1.15237	0.48586
1.10E 04	12.2573	1209.61	1204.59	240.158	297.850	1.24023	1.15999	0.49349
1.15E 04	13.1788	1191.21	1184.99	210.102	262.886	1.25123	1.16732	0.50082
1.20E 04	14.1267	1161.96	1154.48	185.231	233.709	1.26172	1.17430	0.50781
1.25E 04	15.1012	1125.26	1116.45	164.513	209.190	1.27157	1.18087	0.51438
1.30E 04	16.1023	1084.14	1073.97	147.153	188.459	1.28070	1.18695	0.52047
1.35E 04	17.1300	1041.06	1029.51	132.533	170.837	1.28901	1.19248	0.52601
1.40E 04	18.1849	997.937	984.994	120.168	155.785	1.29639	1.19739	0.53092
1.45E 04	19.2640	956.149	941.807	109.672	142.875	1.30274	1.20163	0.53516
1.50E 04	20.3690	916.650	900.949	100.736	131.762	1.30799	1.20512	0.53866
1.55E 04	21.5003	880.271	863.131	93.1083	122.165	1.31207	1.20784	0.54138
1.60E 04	22.6550	847.412	828.877	86.5841	113.853	1.31494	1.20975	0.54329
1.65E 04	23.8351	818.519	798.591	80.9928	106.634	1.31658	1.21085	0.54439
1.70E 04	25.0389	793.918	772.603	76.1918	100.347	1.31703	1.21114	0.54469
1.75E 04	26.2693	773.883	751.184	72.0600	94.8544	1.31633	1.21067	0.54422
1.80E 04	27.5153	758.635	734.558	68.4935	90.0392	1.31456	1.20950	0.54304
1.85E 04	28.7883	748.339	722.888	65.4029	85.7996	1.31186	1.20770	0.54124
1.90E 04	30.0840	743.089	716.267	62.7105	82.0479	1.30836	1.20537	0.53891
1.95E 04	31.4022	742.901	714.712	60.3493	78.7078	1.30420	1.20260	0.53614
2.00E 04	32.7426	747.718	718.163	58.2618	75.7138	1.29954	1.19950	0.53303
2.05E 04	34.1052	757.408	726.489	56.3989	73.0100	1.29453	1.19616	0.52969
2.10E 04	35.4857	771.787	739.504	54.7197	70.5492	1.28928	1.19266	0.52619
2.15E 04	36.8961	790.634	756.984	53.1903	68.2921	1.28392	1.18909	0.52261
2.20E 04	38.3240	813.706	778.666	51.7832	66.2063	1.27853	1.18550	0.51902
2.25E 04	39.7733	840.761	804.367	50.4763	64.2655	1.27318	1.18194	0.51545
2.30E 04	41.2440	871.566	833.791	49.2522	62.4484	1.26793	1.17844	0.51195
2.35E 04	42.7358	905.508	866.746	48.0973	60.7379	1.26281	1.17503	0.50854
2.40E 04	44.2486	943.598	903.041	47.0008	59.1203	1.25786	1.17173	0.50524
2.45E 04	45.7823	984.473	942.513	45.9546	57.5844	1.25307	1.16855	0.50205
2.50E 04	47.3367	1028.40	985.024	44.9521	56.1213	1.24847	1.16548	0.49898
2.55E 04	48.9117	1075.26	1030.46	43.9883	54.7239	1.24405	1.16254	0.49604
2.60E 04	50.5071	1124.90	1076.74	43.0594	53.3860	1.23982	1.15972	0.49321
2.65E 04	52.1228	1177.44	1129.78	42.1622	52.1028	1.23577	1.15702	0.49051
2.70E 04	53.7588	1232.65	1183.54	41.2943	50.8702	1.23189	1.15444	0.48793
2.75E 04	55.4146	1290.54	1239.97	40.4536	49.6844	1.22818	1.15197	0.48545
2.80E 04	57.0907	1351.09	1299.05	39.6385	48.5426	1.22463	1.14960	0.48309
2.85E 04	58.7865	1414.29	1360.77	38.8476	47.4420	1.22123	1.14734	0.48082
2.90E 04	60.5020	1480.13	1425.13	38.0797	46.3803	1.21798	1.14517	0.47865
2.95E 04	62.2371	1548.62	1492.12	37.3337	45.3553	1.21486	1.14310	0.47657
3.00E 04	63.9917	1619.75	1561.75	36.6088	44.3652	1.21187	1.14111	0.47458
3.05E 04	65.7657	1693.56	1634.04	35.9040	43.4082	1.20901	1.13920	0.47267
3.10E 04	67.5589	1770.05	1709.01	35.2187	42.4878	1.20626	1.13737	0.47084
3.15E 04	69.3713	1849.25	1786.68	34.5521	41.5874	1.20361	1.13561	0.46908
3.20E 04	71.2028	1931.18	1867.38	33.9036	40.7208	1.20108	1.13392	0.46738
3.25E 04	73.0533	2015.83	1950.24	33.2726	39.8817	1.19863	1.13229	0.46576
3.30E 04	74.9226	2103.37	2036.19	32.6585	39.0688	1.19628	1.13072	0.46419
3.35E 04	76.8107	2193.70	2124.97	32.0607	38.2811	1.19402	1.12922	0.46268
3.40E 04	78.7175	2286.69	2216.60	31.4787	37.5175	1.19184	1.12776	0.46122
3.45E 04	80.6429	2382.98	2311.14	30.9121	36.7770	1.18973	1.12636	0.45982
3.50E 04	82.5863	2482.02	2408.51	30.3602	36.0588	1.18770	1.12501	0.45847
3.55E 04	84.5451	2584.03	2509.06	29.8226	35.3618	1.18574	1.12370	0.45716
3.60E 04	86.5257	2689.07	2612.53	29.2990	34.6854	1.18384	1.12244	0.45590
3.65E 04	88.5286	2797.16	2719.06	28.7888	34.0286	1.18201	1.12122	0.45467
3.70E 04	90.5457	2908.37	2828.69	28.2916	33.3908	1.18024	1.12004	0.45349
3.75E 04	92.5808	3022.72	2941.47	27.8070	32.7711	1.17852	1.11889	0.45235
3.80E 04	94.6239	3140.26	3057.45	27.3347	32.1699	1.17686	1.11779	0.45124
3.85E 04	96.6749	3261.04	3176.66	26.8742	31.5838	1.17525	1.11671	0.45016
3.90E 04	98.7337	3385.10	3299.15	26.4251	31.0147	1.17368	1.11567	0.44912
3.95E 04	100.8000	3512.48	3424.97	25.9872	30.4614	1.17217	1.11466	0.44811
4.00E 04	102.8725	3643.24	3554.17	25.5601	29.9231	1.17070	1.11368	0.44713
4.05E 04	104.9517	3777.41	3686.79	25.1434	29.3994	1.16927	1.11273	0.44618

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(g) Concluded. Pressure,  $10^1$  atmospheres

Temperature, °K	Pure gas thermal conductivity, cal/(cm)(sec)(°K)		Pure gas viscosity, g/(cm)(sec)		Binary mixture thermal con- ductivity parameter, cal (cm)(sec)(°K)	Viscosity parameter, g/(cm)(sec)	Electrical conductivity second ap- proximation parameter	Electrical conductivity, mhos/m
T	$\lambda_{H^+}$	$\lambda_e$	$\eta_{H^+}$	$\eta_e$	$\lambda_{H^+-e}$	$\eta_{H^+-e}$	$\Delta_c$	$\sigma$
5.00E-03	0.43323E-05	0.18572E-03	0.58603E-06	0.13670E-07	0.13136E-03	0.19333E-07	0.79662E-03	0.28462
5.50E-03	0.41100E-05	0.26222E-03	0.82742E-06	0.19301E-07	0.18547E-03	0.27296E-07	0.30959E-03	1.34529
6.00E-03	0.38310E-05	0.35388E-03	0.11324E-05	0.26416E-07	0.25383E-03	0.37358E-07	0.34943E-04	4.95103
6.50E-03	0.11100E-04	0.47840E-03	0.15096E-05	0.35213E-07	0.33837E-03	0.49799E-07	0.66588E-04	14.9809
7.00E-03	0.14543E-04	0.62346E-03	0.19673E-05	0.45891E-07	0.44009E-03	0.64899E-07	0.68339E-03	38.7009
7.50E-03	0.18584E-04	0.79670E-03	0.25139E-05	0.58642E-07	0.56350E-03	0.82933E-07	0.24333E-02	87.6718
8.00E-03	0.23142E-04	0.10007E-02	0.31575E-05	0.73655E-07	0.70776E-03	0.10416E-06	0.61215E-02	177.622
8.50E-03	0.28673E-04	0.12377E-02	0.39056E-05	0.91107E-07	0.87546E-03	0.12884E-06	0.12592E-01	326.795
9.00E-03	0.35229E-04	0.15102E-02	0.47655E-05	0.11116E-06	0.10682E-02	0.15721E-06	0.22324E-01	552.932
9.50E-03	0.42459E-04	0.18202E-02	0.57434E-05	0.13398E-06	0.12874E-02	0.18947E-06	0.35094E-01	869.789
1.00E-04	0.50803E-04	0.21693E-02	0.68451E-05	0.15968E-06	0.15343E-02	0.22581E-06	0.49951E-01	1284.38
1.05E-04	0.55656E-04	0.25591E-02	0.80751E-05	0.18837E-06	0.18101E-02	0.26639E-06	0.65554E-01	1795.88
1.10E-04	0.69763E-04	0.29907E-02	0.94368E-05	0.22013E-06	0.21153E-02	0.31131E-06	0.80604E-01	2396.45
1.15E-04	0.80613E-04	0.34646E-02	0.10932E-04	0.25502E-06	0.24505E-02	0.36065E-06	0.94152E-01	3073.42
1.20E-04	0.92863E-04	0.39809E-02	0.12562E-04	0.29302E-06	0.28157E-02	0.41440E-06	0.10570	3811.83
1.25E-04	0.10592E-02	0.45392E-02	0.14323E-04	0.33412E-06	0.32106E-02	0.47251E-06	0.11512	4596.60
1.30E-04	0.11566E-03	0.51383E-02	0.16214E-04	0.37822E-06	0.36343E-02	0.53488E-06	0.12257	5413.77
1.35E-04	0.13474E-03	0.57764E-02	0.18227E-04	0.42518E-06	0.40856E-02	0.60129E-06	0.12836	6251.04
1.40E-04	0.15048E-03	0.64507E-02	0.20355E-04	0.47482E-06	0.45626E-02	0.67149E-06	0.13284	7097.74
1.45E-04	0.16650E-03	0.71581E-02	0.22587E-04	0.52688E-06	0.50629E-02	0.74513E-06	0.13638	7944.51
1.50E-04	0.18415E-03	0.78945E-02	0.24911E-04	0.58109E-06	0.55838E-02	0.82178E-06	0.13932	8783.05
1.55E-04	0.20150E-03	0.86554E-02	0.27312E-04	0.63710E-06	0.61220E-02	0.90099E-06	0.14194	9605.82
1.60E-04	0.22011E-03	0.94359E-02	0.29774E-04	0.69455E-06	0.66740E-02	0.98224E-06	0.14448	10406.1
1.65E-04	0.23860E-03	0.10231E-01	0.32283E-04	0.75306E-06	0.72363E-02	0.10650E-05	0.14711	11177.8
1.70E-04	0.25742E-03	0.11035E-01	0.34822E-04	0.81228E-06	0.78053E-02	0.11487E-05	0.14998	11915.9
1.75E-04	0.27630E-03	0.11845E-01	0.37376E-04	0.87186E-06	0.83779E-02	0.12330E-05	0.15316	12616.6
1.80E-04	0.29521E-03	0.12655E-01	0.39933E-04	0.93152E-06	0.89511E-02	0.13174E-05	0.15670	13277.4
1.85E-04	0.31407E-03	0.13464E-01	0.42484E-04	0.99103E-06	0.95230E-02	0.14015E-05	0.16058	13897.3
1.90E-04	0.33284E-03	0.14268E-01	0.45023E-04	0.10503E-05	0.10092E-01	0.14853E-05	0.16480	14476.8
1.95E-04	0.35154E-03	0.15068E-01	0.47547E-04	0.11091E-05	0.10658E-01	0.15686E-05	0.16928	15017.9
2.00E-04	0.37006E-03	0.15864E-01	0.50057E-04	0.11677E-05	0.11220E-01	0.16514E-05	0.17398	15523.5
2.05E-04	0.38853E-03	0.16656E-01	0.52556E-04	0.12260E-05	0.11781E-01	0.17338E-05	0.17882	15997.2
2.10E-04	0.40695E-03	0.17446E-01	0.55049E-04	0.12841E-05	0.12339E-01	0.18160E-05	0.18374	16443.2
2.15E-04	0.42538E-03	0.18235E-01	0.57541E-04	0.13423E-05	0.12898E-01	0.18982E-05	0.18868	16865.6
2.20E-04	0.44385E-03	0.19027E-01	0.60040E-04	0.14005E-05	0.13458E-01	0.19807E-05	0.19358	17268.4
2.25E-04	0.46242E-03	0.19824E-01	0.62552E-04	0.14591E-05	0.14021E-01	0.20635E-05	0.19841	17655.2
2.30E-04	0.48114E-03	0.20626E-01	0.65083E-04	0.15182E-05	0.14589E-01	0.21471E-05	0.20313	18029.2
2.35E-04	0.50003E-03	0.21436E-01	0.67640E-04	0.15778E-05	0.15162E-01	0.22314E-05	0.20772	18393.2
2.40E-04	0.51919E-03	0.22256E-01	0.70226E-04	0.16382E-05	0.15741E-01	0.23167E-05	0.21217	18749.5
2.45E-04	0.53852E-03	0.23086E-01	0.72846E-04	0.16993E-05	0.16329E-01	0.24031E-05	0.21646	19099.8
2.50E-04	0.55817E-03	0.23928E-01	0.75504E-04	0.17613E-05	0.16924E-01	0.24908E-05	0.22060	19445.9
2.55E-04	0.57812E-03	0.24783E-01	0.78203E-04	0.18242E-05	0.17529E-01	0.25798E-05	0.22458	19788.8
2.60E-04	0.59839E-03	0.25652E-01	0.80944E-04	0.18882E-05	0.18144E-01	0.26703E-05	0.22841	20129.6
2.65E-04	0.61890E-03	0.26536E-01	0.83732E-04	0.19532E-05	0.18769E-01	0.27622E-05	0.23208	20469.1
2.70E-04	0.63955E-03	0.27434E-01	0.86566E-04	0.20193E-05	0.19404E-01	0.28557E-05	0.23561	20807.8
2.75E-04	0.66120E-03	0.28347E-01	0.89449E-04	0.20866E-05	0.20050E-01	0.29508E-05	0.23900	21146.3
2.80E-04	0.68294E-03	0.29277E-01	0.92381E-04	0.21550E-05	0.20707E-01	0.30476E-05	0.24225	21485.0
2.85E-04	0.70495E-03	0.30222E-01	0.95365E-04	0.22246E-05	0.21376E-01	0.31460E-05	0.24538	21824.0
2.90E-04	0.72743E-03	0.31184E-01	0.98400E-04	0.22954E-05	0.22057E-01	0.32461E-05	0.24838	22163.8
2.95E-04	0.75026E-03	0.32163E-01	0.10149E-03	0.23674E-05	0.22749E-01	0.33480E-05	0.25126	22504.4
3.00E-04	0.77347E-03	0.33158E-01	0.10463E-03	0.24406E-05	0.23453E-01	0.34516E-05	0.25404	22846.0
3.05E-04	0.79708E-03	0.34170E-01	0.10782E-03	0.25151E-05	0.24168E-01	0.35570E-05	0.25671	23188.7
3.10E-04	0.82110E-03	0.35195E-01	0.11107E-03	0.25909E-05	0.24897E-01	0.36641E-05	0.25928	23532.5
3.15E-04	0.84551E-03	0.36246E-01	0.11437E-03	0.26680E-05	0.25637E-01	0.37731E-05	0.26176	23877.6
3.20E-04	0.87033E-03	0.37310E-01	0.11773E-03	0.27463E-05	0.26389E-01	0.38838E-05	0.26415	24224.0
3.25E-04	0.89550E-03	0.38392E-01	0.12114E-03	0.28259E-05	0.27154E-01	0.39964E-05	0.26645	24571.6
3.30E-04	0.92120E-03	0.39491E-01	0.12461E-03	0.29068E-05	0.27932E-01	0.41108E-05	0.26868	24920.6
3.35E-04	0.94725E-03	0.40608E-01	0.12813E-03	0.29890E-05	0.28722E-01	0.42271E-05	0.27082	25270.9
3.40E-04	0.97372E-03	0.41742E-01	0.13171E-03	0.30725E-05	0.29524E-01	0.43452E-05	0.27290	25622.5
3.45E-04	0.10006E-02	0.42894E-01	0.13535E-03	0.31573E-05	0.30339E-01	0.44651E-05	0.27491	25975.5
3.50E-04	0.10279E-02	0.44005E-01	0.13904E-03	0.32435E-05	0.31167E-01	0.45869E-05	0.27685	26329.8
3.55E-04	0.10556E-02	0.45253E-01	0.14279E-03	0.33309E-05	0.32007E-01	0.47106E-05	0.27873	26685.4
3.60E-04	0.10838E-02	0.46459E-01	0.14660E-03	0.34197E-05	0.32861E-01	0.48362E-05	0.28055	27042.4
3.65E-04	0.11123E-02	0.47684E-01	0.15045E-03	0.35098E-05	0.33727E-01	0.49637E-05	0.28232	27400.7
3.70E-04	0.11413E-02	0.48926E-01	0.15438E-03	0.36013E-05	0.34606E-01	0.50930E-05	0.28403	27760.2
3.75E-04	0.11707E-02	0.50187E-01	0.15836E-03	0.36941E-05	0.35497E-01	0.52243E-05	0.28569	28121.0
3.80E-04	0.12006E-02	0.51466E-01	0.16240E-03	0.37883E-05	0.36402E-01	0.53574E-05	0.28730	28483.2
3.85E-04	0.12308E-02	0.52764E-01	0.16649E-03	0.38838E-05	0.37320E-01	0.54925E-05	0.28887	28846.5
3.90E-04	0.12615E-02	0.54079E-01	0.17064E-03	0.39806E-05	0.38250E-01	0.56294E-05	0.29039	29211.1
3.95E-04	0.12926E-02	0.55414E-01	0.17485E-03	0.40788E-05	0.39194E-01	0.57683E-05	0.29187	29577.0
4.00E-04	0.13242E-02	0.56766E-01	0.17912E-03	0.41784E-05	0.40151E-01	0.59091E-05	0.29331	29944.0
4.05E-04	0.13562E-02	0.58138E-01	0.18345E-03	0.42793E-05	0.41121E-01	0.60519E-05	0.29471	30312.3

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(h) Pressure,  $10^2$  atmospheres

Temperature, °K	Mole fractions		Binary diffusion coefficients, cm <sup>2</sup> /sec			Thermal diffusion coefficients, g/(cm)(sec)		
T	x <sub>H</sub>	x <sub>H+</sub>	D <sub>H-H+</sub>	D <sub>H+-e</sub>	D <sub>H-e</sub>	D <sub>H</sub> <sup>T</sup>	D <sub>H+</sub> <sup>T</sup>	D <sub>e</sub> <sup>T</sup>
5.00E 03	1.00000	0.34134E-06	0.80735	0.17991	115.025	-0.12365E-10	0.12452E-10	-0.86264E-13
5.50E 03	1.00000	0.16127E-05	0.94969	0.28672	137.695	-0.61861E-10	0.62155E-10	-0.29318E-12
6.00E 03	0.99999	0.59349E-05	1.10147	0.43968	162.430	-0.23971E-09	0.24028E-09	-0.56210E-12
6.50E 03	0.99996	0.18035E-04	1.26226	0.65275	189.213	-0.76154E-09	0.76130E-09	0.23262E-12
7.00E 03	0.99991	0.47058E-04	1.43156	0.94263	217.997	-0.20652E-08	0.20583E-08	0.68884E-11
7.50E 03	0.99976	0.10869E-03	1.60868	1.32904	248.698	-0.49248E-08	0.48910E-08	0.33845E-10
8.00E 03	0.99955	0.22727E-03	1.79286	1.83506	281.187	-0.10564E-07	0.10447E-07	0.11631E-09
8.50E 03	0.99912	0.43765E-03	1.98316	2.48740	315.293	-0.20755E-07	0.20428E-07	0.32720E-09
9.00E 03	0.99843	0.78679E-03	2.17865	3.31673	350.801	-0.37926E-07	0.37129E-07	0.79737E-09
9.50E 03	0.99733	0.13342E-02	2.37839	4.35787	387.469	-0.65320E-07	0.63587E-07	0.17326E-08
1.00E 04	0.99565	0.21525E-02	2.58156	5.65008	425.032	-0.10726E-06	0.10385E-06	0.34175E-08
1.05E 04	0.99335	0.33264E-02	2.78754	7.23708	463.226	-0.16958E-06	0.16338E-06	0.61999E-08
1.10E 04	0.99010	0.49517E-02	2.99601	9.16707	501.789	-0.26003E-06	0.24958E-06	0.10453E-07
1.15E 04	0.98573	0.71328E-02	3.20700	11.4925	540.486	-0.38867E-06	0.37215E-06	0.16524E-07
1.20E 04	0.98004	0.99806E-02	3.42094	14.2694	579.102	-0.56783E-06	0.54315E-06	0.24679E-07
1.25E 04	0.97276	0.13609E-01	3.63866	17.5569	617.458	-0.81154E-06	0.77648E-06	0.35063E-07
1.30E 04	0.96374	0.18130E-01	3.86137	21.4151	655.401	-0.11344E-05	0.10867E-05	0.47673E-07
1.35E 04	0.95270	0.23652E-01	4.09056	25.9041	692.804	-0.15496E-05	0.14873E-05	0.62326E-07
1.40E 04	0.93945	0.30274E-01	4.32794	31.0806	729.564	-0.20672E-05	0.19884E-05	0.78859E-07
1.45E 04	0.92384	0.38080E-01	4.57527	36.9950	765.591	-0.26916E-05	0.25948E-05	0.96812E-07
1.50E 04	0.89573	0.47136E-01	4.83424	43.6876	800.810	-0.34200E-05	0.33041E-05	0.11583E-06
1.55E 04	0.86503	0.57487E-01	5.10632	51.1844	835.152	-0.42413E-05	0.41058E-05	0.13556E-06
1.60E 04	0.82170	0.69148E-01	5.39267	59.4931	868.556	-0.51368E-05	0.49811E-05	0.15570E-06
1.65E 04	0.83579	0.82106E-01	5.69492	68.5987	900.971	-0.60804E-05	0.59043E-05	0.17611E-06
1.70E 04	0.80737	0.96317E-01	6.01669	78.4619	932.354	-0.70415E-05	0.68447E-05	0.19680E-06
1.75E 04	0.77655	0.11170	6.34254	89.0173	962.680	-0.79863E-05	0.77683E-05	0.21797E-06
1.80E 04	0.74369	0.12815	6.68909	100.176	991.944	-0.88812E-05	0.86412E-05	0.24005E-06
1.85E 04	0.70855	0.14552	7.04955	111.827	1020.17	-0.96949E-05	0.94312E-05	0.26364E-06
1.90E 04	0.67270	0.16365	7.42293	123.848	1047.41	-0.10400E-04	0.10110E-04	0.28950E-06
1.95E 04	0.63532	0.18234	7.80815	136.109	1073.76	-0.10974E-04	0.10656E-04	0.31846E-06
2.00E 04	0.59724	0.20138	8.20409	148.483	1099.37	-0.11403E-04	0.11052E-04	0.35140E-06
2.05E 04	0.55887	0.22056	8.60967	160.855	1124.40	-0.11679E-04	0.11290E-04	0.38911E-06
2.10E 04	0.52060	0.23967	9.02392	173.127	1149.08	-0.11801E-04	0.11368E-04	0.43227E-06
2.15E 04	0.48302	0.25849	9.44597	185.225	1173.66	-0.11774E-04	0.11292E-04	0.48136E-06
2.20E 04	0.44634	0.27683	9.87510	197.101	1198.41	-0.11609E-04	0.11073E-04	0.53666E-06
2.25E 04	0.41055	0.29453	10.3107	208.729	1223.63	-0.11324E-04	0.10725E-04	0.59820E-06
2.30E 04	0.37714	0.31143	10.7523	220.168	1249.60	-0.10935E-04	0.10270E-04	0.66581E-06
2.35E 04	0.34515	0.32743	11.1996	231.254	1276.59	-0.10465E-04	0.97261E-05	0.73915E-06
2.40E 04	0.31512	0.34244	11.6522	242.201	1304.85	-0.99336E-05	0.91159E-05	0.81776E-06
2.45E 04	0.28717	0.35641	12.1101	252.989	1334.58	-0.93604E-05	0.84593E-05	0.90109E-06
2.50E 04	0.26134	0.36933	12.5731	263.667	1365.96	-0.87635E-05	0.77750E-05	0.98856E-06
2.55E 04	0.23761	0.38120	13.0412	274.288	1399.10	-0.81587E-05	0.70791E-05	0.10796E-05
2.60E 04	0.21593	0.39203	13.5143	284.901	1434.07	-0.75588E-05	0.63852E-05	0.11737E-05
2.65E 04	0.19623	0.40188	13.9924	295.558	1470.90	-0.69742E-05	0.57039E-05	0.12703E-05
2.70E 04	0.17840	0.41080	14.4757	306.305	1509.59	-0.64124E-05	0.50434E-05	0.13690E-05
2.75E 04	0.16230	0.41885	14.9641	317.186	1550.10	-0.58789E-05	0.44094E-05	0.14695E-05
2.80E 04	0.14782	0.42605	15.4577	328.239	1592.37	-0.53769E-05	0.38054E-05	0.15715E-05
2.85E 04	0.13480	0.43266	15.9566	339.498	1636.31	-0.49082E-05	0.32335E-05	0.16747E-05
2.90E 04	0.12313	0.43844	16.4608	350.995	1681.83	-0.44733E-05	0.26942E-05	0.17790E-05
2.95E 04	0.11266	0.44367	16.9705	362.757	1728.84	-0.40715E-05	0.21872E-05	0.18843E-05
3.00E 04	0.10328	0.44836	17.4855	374.807	1777.22	-0.37018E-05	0.17112E-05	0.19905E-05
3.05E 04	0.94666E-01	0.45257	18.0061	387.165	1826.88	-0.33623E-05	0.12648E-05	0.20975E-05
3.10E 04	0.87524E-01	0.45634	18.5323	399.851	1877.70	-0.30513E-05	0.84588E-06	0.22054E-05
3.15E 04	0.80555E-01	0.45972	19.0640	412.878	1929.60	-0.27665E-05	0.45245E-06	0.23140E-05
3.20E 04	0.74474E-01	0.46276	19.6014	426.263	1982.46	-0.25058E-05	0.82346E-07	0.24235E-05
3.25E 04	0.69039E-01	0.46550	20.1444	440.016	2036.20	-0.22672E-05	0.26654E-06	0.25337E-05
3.30E 04	0.64075E-01	0.46796	20.6932	454.150	2090.74	-0.20486E-05	0.59625E-06	0.26449E-05
3.35E 04	0.59626E-01	0.47015	21.2476	468.673	2145.99	-0.18482E-05	0.90872E-06	0.27569E-05
3.40E 04	0.55608E-01	0.47220	21.8078	483.596	2201.86	-0.16641E-05	0.12057E-05	0.28699E-05
3.45E 04	0.51968E-01	0.47402	22.3738	498.927	2258.30	-0.14948E-05	0.14890E-05	0.29838E-05
3.50E 04	0.48666E-01	0.47567	22.9455	514.673	2315.22	-0.13387E-05	0.17600E-05	0.30987E-05
3.55E 04	0.45666E-01	0.47717	23.5229	530.841	2372.57	-0.11945E-05	0.20201E-05	0.32147E-05
3.60E 04	0.42931E-01	0.47853	24.1062	547.440	2430.27	-0.10610E-05	0.22707E-05	0.33317E-05
3.65E 04	0.40437E-01	0.47978	24.6952	564.475	2488.26	-0.93712E-06	0.25127E-05	0.34499E-05
3.70E 04	0.38156E-01	0.48092	25.2900	581.953	2546.50	-0.82181E-06	0.27474E-05	0.35692E-05
3.75E 04	0.36067E-01	0.48197	25.8905	599.880	2604.93	-0.71421E-06	0.29754E-05	0.36897E-05
3.80E 04	0.34149E-01	0.48293	26.4968	618.261	2663.48	-0.61354E-06	0.31978E-05	0.38114E-05
3.85E 04	0.32366E-01	0.48381	27.1089	637.104	2722.13	-0.51909E-06	0.34152E-05	0.39343E-05
3.90E 04	0.30766E-01	0.48462	27.7268	656.414	2780.80	-0.43023E-06	0.36283E-05	0.40585E-05
3.95E 04	0.29260E-01	0.48537	28.3503	676.196	2839.47	-0.34640E-06	0.38377E-05	0.41841E-05
4.00E 04	0.27872E-01	0.48606	28.9797	696.457	2898.09	-0.26710E-06	0.40438E-05	0.43109E-05
4.05E 04	0.26567E-01	0.48671	29.6147	717.201	2956.61	-0.19186E-06	0.42473E-05	0.44391E-05

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(h) Continued. Pressure,  $10^2$  atmospheres

Temperature, °K	Thermal conductivity, cal/(cm)(sec)(°K)				Viscosity, g/(cm)(sec)	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec		
	Transla- tional	Reaction	Diffusional	Total		$D_{H-H^+}$	$D_{H^+-e}$	$D_{H-e}$
T	$\lambda_t$	$\lambda_r$	$\lambda_d$	$\lambda$	$\eta$			
5.00E 03	0.41114E-02	0.55176E-07	-0.81237E-10	0.41115E-02	0.55614E-03	0.33808	621.212	41.0914
5.50E 03	0.44032E-02	0.22874E-06	-0.24346E-09	0.44835E-02	0.60641E-03	0.39509	725.722	49.7516
6.00E 03	0.48553E-02	0.74877E-06	-0.41581E-09	0.48566E-02	0.65669E-03	0.45552	836.002	59.7425
6.50E 03	0.52305E-02	0.20394E-05	0.15470E-09	0.52325E-02	0.70702E-03	0.51927	951.236	71.6620
7.00E 03	0.56054E-02	0.48111E-05	0.41533E-08	0.56142E-02	0.75739E-03	0.58625	1070.23	86.4726
7.50E 03	0.59964E-02	0.10117E-04	0.18656E-07	0.60065E-02	0.80774E-03	0.65636	1191.35	105.538
8.00E 03	0.63968E-02	0.19376E-04	0.59090E-07	0.64162E-02	0.85798E-03	0.72953	1312.59	130.586
8.50E 03	0.68170E-02	0.34359E-04	0.15445E-06	0.68522E-02	0.90791E-03	0.80567	1431.65	163.595
9.00E 03	0.72611E-02	0.57139E-04	0.35255E-06	0.73243E-02	0.95727E-03	0.88473	1546.14	206.641
9.50E 03	0.77222E-02	0.90014E-04	0.72320E-06	0.78422E-02	0.10056E-02	0.96663	1653.72	261.723
1.00E 04	0.82790E-02	0.13541E-03	0.13571E-05	0.84144E-02	0.10525E-02	1.05131	1752.30	330.628
1.05E 04	0.88511E-02	0.19579E-03	0.23592E-05	0.90468E-02	0.10970E-02	1.13874	1840.11	414.820
1.10E 04	0.94603E-02	0.27351E-03	0.38379E-05	0.97433E-02	0.11384E-02	1.22884	1915.83	515.375
1.15E 04	0.10136E-01	0.37076E-03	0.58909E-05	0.10505E-01	0.11755E-02	1.32160	1978.59	632.952
1.20E 04	0.10842E-01	0.46944E-03	0.85921E-05	0.11331E-01	0.12070E-02	1.41696	2027.97	767.788
1.25E 04	0.11507E-01	0.63106E-03	0.11981E-04	0.12218E-01	0.12314E-02	1.51490	2064.03	919.727
1.30E 04	0.12304E-01	0.79656E-03	0.16058E-04	0.13160E-01	0.12473E-02	1.61538	2087.18	1088.29
1.35E 04	0.13164E-01	0.98673E-03	0.20780E-04	0.14151E-01	0.12535E-02	1.71840	2098.12	1272.74
1.40E 04	0.13960E-01	0.12011E-02	0.26067E-04	0.15182E-01	0.12489E-02	1.82391	2097.74	1472.21
1.45E 04	0.14803E-01	0.14391E-02	0.31811E-04	0.16242E-01	0.12332E-02	1.93191	2087.00	1685.78
1.50E 04	0.15622E-01	0.16990E-02	0.37885E-04	0.17321E-01	0.12066E-02	2.04238	2066.86	1912.51
1.55E 04	0.16429E-01	0.19784E-02	0.44162E-04	0.18407E-01	0.11699E-02	2.15529	2038.22	2151.55
1.60E 04	0.17213E-01	0.22743E-02	0.50532E-04	0.19492E-01	0.11246E-02	2.27062	2001.88	2402.13
1.65E 04	0.17982E-01	0.25824E-02	0.56915E-04	0.20565E-01	0.10725E-02	2.38836	1958.57	2663.55
1.70E 04	0.18719E-01	0.28980E-02	0.63276E-04	0.21617E-01	0.10156E-02	2.50848	1908.94	2935.18
1.75E 04	0.19424E-01	0.32153E-02	0.69636E-04	0.22643E-01	0.95584E-03	2.63096	1853.60	3216.40
1.80E 04	0.20108E-01	0.35280E-02	0.76069E-04	0.23636E-01	0.89515E-03	2.75578	1793.18	3506.60
1.85E 04	0.20762E-01	0.38291E-02	0.82691E-04	0.24591E-01	0.83504E-03	2.88290	1728.35	3805.11
1.90E 04	0.21392E-01	0.41114E-02	0.89647E-04	0.25504E-01	0.7776E-03	3.01232	1659.84	4111.22
1.95E 04	0.22002E-01	0.43676E-02	0.97079E-04	0.26370E-01	0.72122E-03	3.14400	1588.46	4424.11
2.00E 04	0.22594E-01	0.45907E-02	0.10510E-03	0.27185E-01	0.66907E-03	3.27793	1515.11	4742.93
2.05E 04	0.23172E-01	0.47743E-02	0.11376E-03	0.27946E-01	0.62068E-03	3.41409	1440.74	5066.75
2.10E 04	0.23737E-01	0.49133E-02	0.12301E-03	0.28650E-01	0.57672E-03	3.55245	1366.34	5394.64
2.15E 04	0.24291E-01	0.50038E-02	0.13273E-03	0.29295E-01	0.53575E-03	3.69300	1292.86	5725.68
2.20E 04	0.24836E-01	0.50439E-02	0.14268E-03	0.29880E-01	0.49917E-03	3.83573	1221.22	6059.03
2.25E 04	0.25373E-01	0.50334E-02	0.15255E-03	0.30406E-01	0.46632E-03	3.98062	1152.22	6393.92
2.30E 04	0.25902E-01	0.50743E-02	0.16199E-03	0.30876E-01	0.43698E-03	4.12764	1086.55	6729.73
2.35E 04	0.26418E-01	0.50711E-02	0.17063E-03	0.31295E-01	0.41093E-03	4.27679	1024.73	7065.96
2.40E 04	0.26943E-01	0.50726E-02	0.17815E-03	0.31669E-01	0.38790E-03	4.42805	967.168	7402.25
2.45E 04	0.27469E-01	0.50488E-02	0.18426E-03	0.32005E-01	0.36764E-03	4.58141	914.095	7738.39
2.50E 04	0.27990E-01	0.50449E-02	0.18880E-03	0.32313E-01	0.34991E-03	4.73685	865.623	8074.27
2.55E 04	0.28490E-01	0.50412E-02	0.19166E-03	0.32601E-01	0.33447E-03	4.89435	821.751	8409.90
2.60E 04	0.28992E-01	0.50362E-02	0.19284E-03	0.32878E-01	0.32109E-03	5.05391	782.385	8745.36
2.65E 04	0.29496E-01	0.50345E-02	0.19245E-03	0.33151E-01	0.30958E-03	5.21551	747.364	9080.81
2.70E 04	0.29994E-01	0.50324E-02	0.19060E-03	0.33427E-01	0.29973E-03	5.37913	716.476	9416.42
2.75E 04	0.30488E-01	0.50304E-02	0.18751E-03	0.33712E-01	0.29139E-03	5.54477	689.479	9752.41
2.80E 04	0.30979E-01	0.50282E-02	0.18336E-03	0.34012E-01	0.28440E-03	5.71240	666.115	10089.0
2.85E 04	0.31468E-01	0.50257E-02	0.17847E-03	0.34330E-01	0.27860E-03	5.88203	646.119	10426.5
2.90E 04	0.31954E-01	0.50230E-02	0.17274E-03	0.34670E-01	0.27389E-03	6.05363	629.234	10765.0
2.95E 04	0.32437E-01	0.50200E-02	0.16667E-03	0.35032E-01	0.27014E-03	6.22719	615.208	11104.8
3.00E 04	0.32917E-01	0.50163E-02	0.16032E-03	0.35418E-01	0.26725E-03	6.40271	603.808	11446.1
3.05E 04	0.33394E-01	0.50128E-02	0.15382E-03	0.35830E-01	0.26515E-03	6.58017	594.814	11789.0
3.10E 04	0.33868E-01	0.50095E-02	0.14728E-03	0.36266E-01	0.26374E-03	6.75956	588.025	12133.8
3.15E 04	0.34339E-01	0.50063E-02	0.14081E-03	0.36728E-01	0.26235E-03	6.94087	583.258	12480.6
3.20E 04	0.34808E-01	0.50030E-02	0.13447E-03	0.37214E-01	0.26273E-03	7.12409	580.350	12829.5
3.25E 04	0.35275E-01	0.50000E-02	0.12831E-03	0.37724E-01	0.26302E-03	7.30921	579.150	13180.7
3.30E 04	0.35739E-01	0.49972E-02	0.12237E-03	0.38258E-01	0.26377E-03	7.49622	579.527	13534.3
3.35E 04	0.36200E-01	0.49947E-02	0.11663E-03	0.38814E-01	0.26495E-03	7.68510	581.362	13890.3
3.40E 04	0.36658E-01	0.49924E-02	0.11137E-03	0.39393E-01	0.26650E-03	7.87586	584.550	14248.8
3.45E 04	0.37113E-01	0.49902E-02	0.10609E-03	0.39993E-01	0.26840E-03	8.06848	588.999	14609.9
3.50E 04	0.37565E-01	0.49881E-02	0.10119E-03	0.40613E-01	0.27062E-03	8.26294	594.626	14973.8
3.55E 04	0.38014E-01	0.49861E-02	0.96557E-04	0.41252E-01	0.27313E-03	8.45925	601.360	15340.3
3.60E 04	0.38460E-01	0.49842E-02	0.92182E-04	0.41911E-01	0.27591E-03	8.65740	609.135	15709.6
3.65E 04	0.38903E-01	0.49824E-02	0.88055E-04	0.42589E-01	0.27894E-03	8.85737	617.896	16081.7
3.70E 04	0.39343E-01	0.49807E-02	0.84165E-04	0.43284E-01	0.28221E-03	9.05915	627.593	16456.7
3.75E 04	0.39779E-01	0.49792E-02	0.80501E-04	0.43997E-01	0.28569E-03	9.26275	638.182	16834.5
3.80E 04	0.40212E-01	0.49780E-02	0.77051E-04	0.44726E-01	0.28937E-03	9.46814	649.627	17215.2
3.85E 04	0.40642E-01	0.49769E-02	0.73802E-04	0.45472E-01	0.29324E-03	9.67533	661.893	17598.9
3.90E 04	0.41069E-01	0.49759E-02	0.70743E-04	0.46234E-01	0.29729E-03	9.88430	674.950	17985.5
3.95E 04	0.41493E-01	0.49750E-02	0.67860E-04	0.47011E-01	0.30152E-03	10.0950	688.775	18375.0
4.00E 04	0.41915E-01	0.49742E-02	0.65144E-04	0.47804E-01	0.30590E-03	10.3076	703.343	18767.5
4.05E 04	0.42337E-01	0.49735E-02	0.62584E-04	0.48611E-01	0.31043E-03	10.5218	718.637	19162.9

TABLE II. - Continued. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(h) Continued. Pressure,  $10^2$  atmospheres

Temperature, °K	Multicomponent diffusion coefficients, cm <sup>2</sup> /sec			Shielded coulombic collision cross sections, $\text{\AA}^2$		Dimensionless parameters for shielded coulombic collisions		
T	D <sub>H<sup>+</sup>-H</sub>	D <sub>e-H</sub>	D <sub>e-H<sup>+</sup></sub>	$\bar{\Omega}_c^{(1,1)}$	$\bar{\Omega}_c^{(2,2)}$	A <sub>c</sub> <sup>*</sup>	E <sub>c</sub> <sup>*</sup>	C <sub>c</sub> <sup>*</sup>
5.00E 03	0.33800	41.0079	41.0078	2632.92	2912.15	1.10605	1.07063	0.40404
5.50E 03	0.35509	49.4061	49.4059	1905.61	2136.38	1.12110	1.08065	0.41407
6.00E 03	0.45552	58.6168	58.6161	1415.98	1609.89	1.13694	1.09121	0.42463
6.50E 03	0.51927	68.6123	68.6107	1075.86	1241.09	1.15358	1.10228	0.43572
7.00E 03	0.58625	79.3328	79.3289	833.250	975.715	1.17093	1.11387	0.44732
7.50E 03	0.65635	90.6792	90.6711	656.211	780.314	1.18912	1.12595	0.45941
8.00E 03	0.72952	102.513	102.498	524.449	633.524	1.20798	1.13851	0.47199
8.50E 03	0.80566	114.661	114.635	424.674	521.294	1.22752	1.15153	0.48501
9.00E 03	0.88470	126.528	126.885	347.961	434.143	1.24768	1.16495	0.49845
9.50E 03	0.96655	139.104	139.038	288.174	365.523	1.26841	1.17876	0.51228
1.00E 04	1.05126	150.982	150.886	241.011	310.819	1.28965	1.19290	0.52643
1.05E 04	1.13866	162.370	162.236	203.401	266.719	1.31129	1.20732	0.54086
1.10E 04	1.22874	173.058	172.917	173.114	230.807	1.33324	1.22195	0.55551
1.15E 04	1.32147	183.028	182.791	148.508	201.293	1.35543	1.23672	0.57029
1.20E 04	1.41875	192.064	191.760	128.358	176.836	1.37763	1.25153	0.58512
1.25E 04	1.51469	200.148	199.771	111.737	156.414	1.39984	1.26629	0.59989
1.30E 04	1.61513	207.268	206.808	97.9388	139.245	1.42176	1.28089	0.61451
1.35E 04	1.71810	213.445	212.894	86.4161	124.720	1.44324	1.29520	0.62883
1.40E 04	1.82356	218.726	218.077	76.7435	112.360	1.46409	1.30909	0.64273
1.45E 04	1.93150	223.179	222.424	68.5859	101.788	1.48410	1.32241	0.65607
1.50E 04	2.04191	226.876	226.011	61.6774	92.7031	1.50303	1.33502	0.66869
1.55E 04	2.15476	229.893	228.911	55.8055	84.8619	1.52067	1.34777	0.68045
1.60E 04	2.27002	232.301	231.198	50.7989	78.0676	1.53680	1.35751	0.69120
1.65E 04	2.38765	234.164	232.934	46.5185	72.1596	1.55120	1.36710	0.70080
1.70E 04	2.50774	235.538	234.178	42.8508	67.0058	1.56370	1.37547	0.70913
1.75E 04	2.63015	236.474	234.979	39.7021	62.4965	1.57414	1.38237	0.71609
1.80E 04	2.75489	237.018	235.385	36.9950	58.5406	1.58239	1.38787	0.72160
1.85E 04	2.88194	237.216	235.442	34.6648	55.0615	1.58840	1.39187	0.72560
1.90E 04	3.01127	237.120	235.201	32.6572	51.9945	1.59213	1.39436	0.72809
1.95E 04	3.14288	236.785	234.718	30.9263	49.2847	1.59362	1.39535	0.72908
2.00E 04	3.27672	236.274	234.057	29.4331	46.8851	1.59294	1.39490	0.72843
2.05E 04	3.41280	235.661	233.291	28.1441	44.7552	1.59021	1.39308	0.72681
2.10E 04	3.55108	235.023	232.499	27.0307	42.8602	1.58561	1.39002	0.72374
2.15E 04	3.69155	234.444	231.765	26.0679	41.1696	1.57933	1.38583	0.71955
2.20E 04	3.83419	234.005	231.173	25.2339	39.6571	1.57158	1.38067	0.71438
2.25E 04	3.97895	233.801	230.809	24.5101	38.2993	1.56259	1.37469	0.70840
2.30E 04	4.12593	233.895	230.749	23.8798	37.0760	1.55261	1.36804	0.70174
2.35E 04	4.27495	234.372	231.064	23.3286	35.9693	1.54185	1.36087	0.69457
2.40E 04	4.42617	235.280	231.815	22.8441	34.9635	1.53053	1.35333	0.68702
2.45E 04	4.57944	236.672	233.049	22.4151	34.0450	1.51884	1.34555	0.67922
2.50E 04	4.73475	238.584	234.806	22.0324	33.2017	1.50695	1.33763	0.67130
2.55E 04	4.89221	241.046	237.111	21.6878	32.4234	1.49500	1.32967	0.66334
2.60E 04	5.05168	244.072	239.982	21.3743	31.7009	1.48313	1.32177	0.65542
2.65E 04	5.21320	247.673	243.425	21.0861	31.0267	1.47143	1.31397	0.64762
2.70E 04	5.37674	251.852	247.452	20.8181	30.3940	1.45998	1.30634	0.63998
2.75E 04	5.54229	256.664	252.051	20.5664	29.7972	1.44883	1.29892	0.63255
2.80E 04	5.70984	261.923	257.217	20.3276	29.2316	1.43803	1.29173	0.62535
2.85E 04	5.87938	267.800	262.941	20.0988	28.6932	1.42761	1.28479	0.61840
2.90E 04	6.05050	274.224	269.213	19.8779	28.1784	1.41758	1.27811	0.61172
2.95E 04	6.22439	281.182	276.019	19.6630	27.6846	1.40795	1.27170	0.60530
3.00E 04	6.39982	288.663	283.349	19.4529	27.2094	1.39873	1.26555	0.59915
3.05E 04	6.57720	296.656	291.190	19.2465	26.7507	1.38990	1.25967	0.59327
3.10E 04	6.75651	305.148	299.532	19.0428	26.3069	1.38146	1.25405	0.58764
3.15E 04	6.93773	314.130	308.363	18.8414	25.8767	1.37340	1.24868	0.58226
3.20E 04	7.12067	323.592	317.675	18.6417	25.4589	1.36570	1.24355	0.57713
3.25E 04	7.30591	333.526	327.459	18.4434	25.0525	1.35834	1.23866	0.57223
3.30E 04	7.49283	343.926	337.709	18.2464	24.6567	1.35132	1.23398	0.56754
3.35E 04	7.68164	354.784	348.418	18.0505	24.2708	1.34461	1.22951	0.56307
3.40E 04	7.87231	366.055	359.581	17.8556	23.8943	1.33820	1.22524	0.55880
3.45E 04	8.06465	377.857	371.193	17.6617	23.5267	1.33207	1.22116	0.55472
3.50E 04	8.25924	390.064	383.252	17.4689	23.1675	1.32627	1.21726	0.55081
3.55E 04	8.45547	402.715	395.756	17.2771	22.8163	1.32061	1.21353	0.54707
3.60E 04	8.65353	415.808	408.702	17.0864	22.4728	1.31525	1.20995	0.54350
3.65E 04	8.85342	429.342	422.089	16.8970	22.1368	1.31011	1.20653	0.54007
3.70E 04	9.05513	443.317	435.918	16.7088	21.8080	1.30518	1.20325	0.53679
3.75E 04	9.25864	457.733	450.188	16.5220	21.4861	1.30046	1.20010	0.53364
3.80E 04	9.46356	472.590	464.901	16.3365	21.1709	1.29592	1.19708	0.53061
3.85E 04	9.67116	487.889	480.057	16.1526	20.8622	1.29157	1.19418	0.52771
3.90E 04	9.87996	503.633	495.658	15.9703	20.5597	1.28738	1.19140	0.52492
3.95E 04	10.0906	519.824	511.706	15.7896	20.2638	1.28336	1.18872	0.52224
4.00E 04	10.3031	536.462	528.204	15.6106	19.9736	1.27949	1.18614	0.51966
4.05E 04	10.5173	553.552	545.154	15.4334	19.6894	1.27576	1.18366	0.51717



TABLE II. - Concluded. TRANSPORT PROPERTIES AND COULOMBIC COLLISION CROSS SECTIONS FOR IONIZING ATOMIC HYDROGEN

(h) Concluded. Pressure,  $10^2$  atmospheres

Temperature, °K	Pure gas thermal conductivity, cal/(cm)(sec)(°K)		Pure gas viscosity, g/(cm)(sec)		Binary mixture thermal con- ductivity parameter, cal (cm)(sec)(°K)	Viscosity parameter, g/(cm)(sec)	Electrical conductivity second ap- proximation parameter	Electrical conductivity, mhos/m
T	$\lambda_{H^+}$	$\lambda_e$	$\eta_{H^+}$	$\eta_e$	$\lambda_{H^+-e}$	$\eta_{H^+-e}$	$\Delta_c$	$\sigma$
5.00E 03	0.46106E-C5	0.20622E-C3	0.65073E-06	0.15179E-07	0.14586E-03	0.21467E-07	0.81361E-03	0.90041E-01
5.50E 03	0.68775E-C5	0.25483E-C3	0.93031E-06	0.21701E-07	0.20853E-03	0.30690E-07	0.34807E-03	0.42605
6.00E 03	0.99325E-C5	0.40865E-C3	0.12895E-05	0.30079E-07	0.28904E-03	0.42538E-07	0.79259E-04	1.57234
6.50E 03	0.12876E-C4	0.55173E-03	0.17409E-05	0.40511E-07	0.39023E-03	0.57432E-07	0.12385E-05	4.78630
7.00E 03	0.16588E-C4	0.72827E-C3	0.22980E-05	0.53606E-07	0.51511E-03	0.75810E-07	0.13917E-03	12.5046
7.50E 03	0.21968E-C4	0.94260E-C3	0.29743E-05	0.69382E-07	0.66670E-03	0.98121E-07	0.55322E-03	28.8599
8.00E 03	0.27971E-C4	0.11991E-C2	0.37836E-05	0.88261E-07	0.84811E-03	0.12482E-06	0.13342E-02	60.1180
8.50E 03	0.35035E-C4	0.15021E-C2	0.47397E-05	0.11056E-06	0.10624E-02	0.15636E-06	0.25867E-02	114.892
9.00E 03	0.43293E-C4	0.18559E-C2	0.58562E-05	0.13661E-06	0.13127E-02	0.19319E-06	0.43979E-02	204.022
9.50E 03	0.52829E-C4	0.22647E-C2	0.71462E-05	0.16670E-06	0.16018E-02	0.23575E-06	0.68004E-02	340.067
1.00E 04	0.63741E-C4	0.27325E-C2	0.86222E-05	0.20113E-06	0.19327E-02	0.28444E-06	0.97415E-02	536.474
1.05E 04	0.76114E-C4	0.32629E-C2	0.10296E-04	0.24017E-06	0.23079E-02	0.33966E-06	0.13074E-01	806.519
1.10E 04	0.90027E-C4	0.38554E-C2	0.12178E-04	0.28408E-06	0.27297E-02	0.40174E-06	0.16572E-01	1162.24
1.15E 04	0.10555E-C3	0.45247E-C2	0.14277E-04	0.33305E-06	0.32003E-02	0.47100E-06	0.19972E-01	1613.48
1.20E 04	0.12273E-C3	0.52613E-C2	0.16602E-04	0.38726E-06	0.37213E-02	0.54767E-06	0.23019E-01	2167.27
1.25E 04	0.14161E-C3	0.60708E-C2	0.19156E-04	0.44685E-06	0.42939E-02	0.63194E-06	0.25508E-01	2827.51
1.30E 04	0.16223E-C3	0.69544E-C2	0.21944E-04	0.51189E-06	0.49188E-02	0.72392E-06	0.27305E-01	3594.99
1.35E 04	0.18457E-C3	0.79123E-02	0.24967E-04	0.58240E-06	0.55963E-02	0.82363E-06	0.28359E-01	4467.69
1.40E 04	0.20863E-C3	0.89438E-02	0.28222E-04	0.65832E-06	0.63259E-02	0.93101E-06	0.28695E-01	5441.12
1.45E 04	0.23438E-C3	0.10047E-C1	0.31704E-04	0.73956E-06	0.71065E-02	0.10459E-05	0.28396E-01	6508.79
1.50E 04	0.26174E-C3	0.11221E-C1	0.35406E-04	0.82592E-06	0.79364E-02	0.11680E-05	0.27587E-01	7662.48
1.55E 04	0.29066E-C3	0.12460E-C1	0.39317E-04	0.91715E-06	0.88130E-02	0.12970E-05	0.26412E-01	8892.54
1.60E 04	0.32101E-C3	0.13761E-C1	0.43423E-04	0.10129E-05	0.97333E-02	0.14325E-05	0.25021E-01	10188.0
1.65E 04	0.35267E-C3	0.15119E-C1	0.47706E-04	0.11128E-05	0.10693E-01	0.15738E-05	0.23555E-01	11536.5
1.70E 04	0.38551E-C3	0.16526E-C1	0.52148E-04	0.12165E-05	0.11689E-01	0.17203E-05	0.22140E-01	12924.8
1.75E 04	0.41936E-C3	0.17978E-C1	0.56727E-04	0.13233E-05	0.12716E-01	0.18714E-05	0.20878E-01	14338.5
1.80E 04	0.45445E-C3	0.19465E-C1	0.61420E-04	0.14327E-05	0.13767E-01	0.20262E-05	0.19852E-01	15762.3
1.85E 04	0.48940E-C3	0.20980E-C1	0.66201E-04	0.15443E-05	0.14839E-01	0.21839E-05	0.19125E-01	17180.9
1.90E 04	0.52523E-C3	0.22516E-01	0.71047E-04	0.16573E-05	0.15925E-01	0.23438E-05	0.18744E-01	18578.7
1.95E 04	0.56135E-C3	0.24064E-01	0.75933E-04	0.17713E-05	0.17021E-01	0.25050E-05	0.18744E-01	19941.2
2.00E 04	0.59760E-C3	0.25618E-C1	0.80837E-04	0.18875E-05	0.18120E-01	0.26667E-05	0.19155E-01	21255.2
2.05E 04	0.63381E-C3	0.27171E-C1	0.85736E-04	0.20000E-05	0.19218E-01	0.28284E-05	0.20001E-01	22509.5
2.10E 04	0.66980E-C3	0.28716E-C1	0.90612E-04	0.21137E-05	0.20311E-01	0.29892E-05	0.21305E-01	23695.4
2.15E 04	0.70562E-C3	0.30249E-C1	0.95449E-04	0.22265E-05	0.21395E-01	0.31488E-05	0.23084E-01	24806.8
2.20E 04	0.74100E-C3	0.31766E-C1	0.10023E-03	0.23382E-05	0.22468E-01	0.33067E-05	0.25351E-01	25840.9
2.25E 04	0.77544E-C3	0.33264E-01	0.10496E-03	0.24484E-05	0.23527E-01	0.34626E-05	0.28109E-01	26797.0
2.30E 04	0.81040E-C3	0.34741E-C1	0.10962E-03	0.25572E-05	0.24572E-01	0.36164E-05	0.31354E-01	27677.1
2.35E 04	0.84436E-C3	0.36157E-01	0.11422E-03	0.26643E-05	0.25602E-01	0.37679E-05	0.35068E-01	28485.1
2.40E 04	0.87764E-C3	0.37632E-C1	0.11875E-03	0.27700E-05	0.26617E-01	0.39173E-05	0.39223E-01	29226.1
2.45E 04	0.91067E-C3	0.39048E-01	0.12321E-03	0.28742E-05	0.27619E-01	0.40647E-05	0.43781E-01	29906.3
2.50E 04	0.94249E-C3	0.40446E-C1	0.12763E-03	0.29771E-05	0.28608E-01	0.42103E-05	0.48694E-01	30532.4
2.55E 04	0.97575E-C3	0.41829E-C1	0.13199E-03	0.30789E-05	0.29586E-01	0.43542E-05	0.53909E-01	31110.9
2.60E 04	0.10077E-C2	0.43206E-C1	0.13631E-03	0.31798E-05	0.30555E-01	0.44969E-05	0.59369E-01	31648.4
2.65E 04	0.10355E-C2	0.44561E-C1	0.14061E-03	0.32800E-05	0.31518E-01	0.46386E-05	0.65019E-01	32151.0
2.70E 04	0.10711E-C2	0.45916E-C1	0.14488E-03	0.33797E-05	0.32476E-01	0.47796E-05	0.70805E-01	32624.3
2.75E 04	0.11026E-C2	0.47267E-01	0.14915E-03	0.34792E-05	0.33432E-01	0.49203E-05	0.76675E-01	33073.2
2.80E 04	0.11341E-C2	0.48618E-01	0.15341E-03	0.35786E-05	0.34387E-01	0.50609E-05	0.82583E-01	33502.3
2.85E 04	0.11657E-C2	0.49970E-C1	0.15768E-03	0.36782E-05	0.35344E-01	0.52017E-05	0.88490E-01	33915.3
2.90E 04	0.11973E-C2	0.51326E-C1	0.16196E-03	0.37781E-05	0.36304E-01	0.53430E-05	0.94362E-01	34315.4
2.95E 04	0.12291E-C2	0.52691E-C1	0.16626E-03	0.38784E-05	0.37269E-01	0.54850E-05	0.10017	34705.6
3.00E 04	0.12617E-02	0.54064E-C1	0.17060E-03	0.39795E-05	0.38240E-01	0.56279E-05	0.10589	35088.0
3.05E 04	0.12934E-C2	0.55448E-C1	0.17496E-03	0.40813E-05	0.39214E-01	0.57719E-05	0.11150	35464.8
3.10E 04	0.13260E-C2	0.56843E-C1	0.17937E-03	0.41840E-05	0.40205E-01	0.59171E-05	0.11699	35837.3
3.15E 04	0.13584E-C2	0.58253E-C1	0.18381E-03	0.42878E-05	0.41202E-01	0.60638E-05	0.12235	36207.2
3.20E 04	0.13921E-C2	0.59677E-C1	0.18831E-03	0.43926E-05	0.42209E-01	0.62121E-05	0.12757	36575.3
3.25E 04	0.14257E-C2	0.61117E-C1	0.19285E-03	0.44986E-05	0.43228E-01	0.63620E-05	0.13265	36947.6
3.30E 04	0.14587E-C2	0.62574E-C1	0.19745E-03	0.46058E-05	0.44258E-01	0.65136E-05	0.13759	37309.8
3.35E 04	0.14940E-C2	0.64048E-C1	0.20210E-03	0.47144E-05	0.45301E-01	0.66671E-05	0.14237	37677.5
3.40E 04	0.15289E-C2	0.65541E-C1	0.20681E-03	0.48243E-05	0.46357E-01	0.68225E-05	0.14702	38046.1
3.45E 04	0.15641E-C2	0.67053E-01	0.21158E-03	0.49355E-05	0.47426E-01	0.69799E-05	0.15151	38416.0
3.50E 04	0.15999E-C2	0.68584E-01	0.21641E-03	0.50483E-05	0.48510E-01	0.71393E-05	0.15587	38787.6
3.55E 04	0.16360E-C2	0.70135E-01	0.22131E-03	0.51624E-05	0.49607E-01	0.73008E-05	0.16008	39160.9
3.60E 04	0.16727E-C2	0.71707E-C1	0.22627E-03	0.52781E-05	0.50718E-01	0.74644E-05	0.16447	39536.3
3.65E 04	0.17098E-C2	0.73299E-C1	0.23129E-03	0.53953E-05	0.51844E-01	0.76301E-05	0.16812	39913.8
3.70E 04	0.17475E-C2	0.74912E-01	0.23638E-03	0.55141E-05	0.52985E-01	0.77981E-05	0.17194	40293.4
3.75E 04	0.17856E-C2	0.76547E-C1	0.24154E-03	0.56344E-05	0.54141E-01	0.79682E-05	0.17564	40675.4
3.80E 04	0.18242E-C2	0.78203E-01	0.24676E-03	0.57562E-05	0.55313E-01	0.81405E-05	0.17923	41059.6
3.85E 04	0.18634E-C2	0.79880E-C1	0.25206E-03	0.58797E-05	0.56499E-01	0.83152E-05	0.18270	41446.2
3.90E 04	0.19030E-C2	0.81579E-C1	0.25742E-03	0.60048E-05	0.57701E-01	0.84920E-05	0.18606	41835.1
3.95E 04	0.19431E-C2	0.83300E-C1	0.26285E-03	0.61315E-05	0.58914E-01	0.86712E-05	0.18932	42226.3
4.00E 04	0.19838E-C2	0.85044E-C1	0.26835E-03	0.62598E-05	0.60151E-01	0.88527E-05	0.19247	42619.8
4.05E 04	0.20250E-C2	0.86809E-C1	0.27392E-03	0.63897E-05	0.61400E-01	0.90364E-05	0.19553	43015.6

\*C14 UNITS, EGT.

F11000 ZEC000

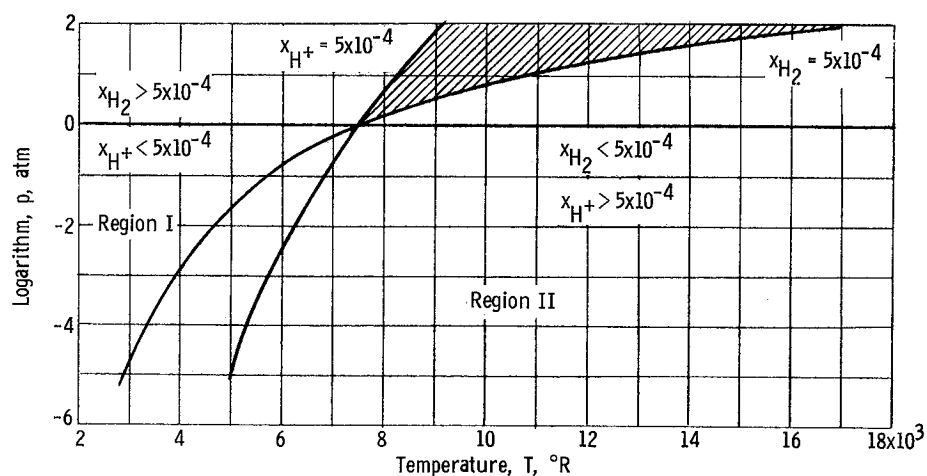


Figure 1. - Illustration of overlap of dissociation and ionization reactions at high temperatures. Region I bounding curve represents area where  $x_{H_2} \geq 5 \times 10^{-4}$ . Region II bounding curve represents area where  $x_{H^+} \geq 5 \times 10^{-4}$ .

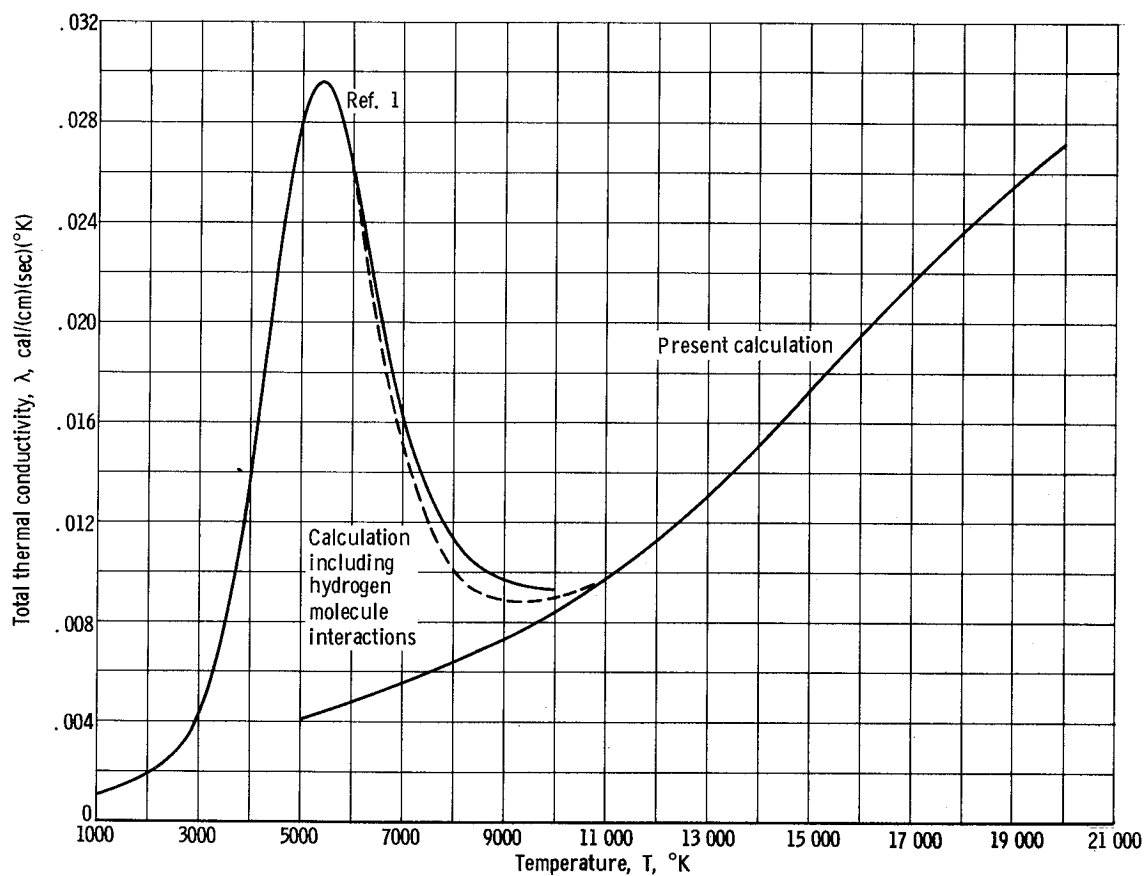
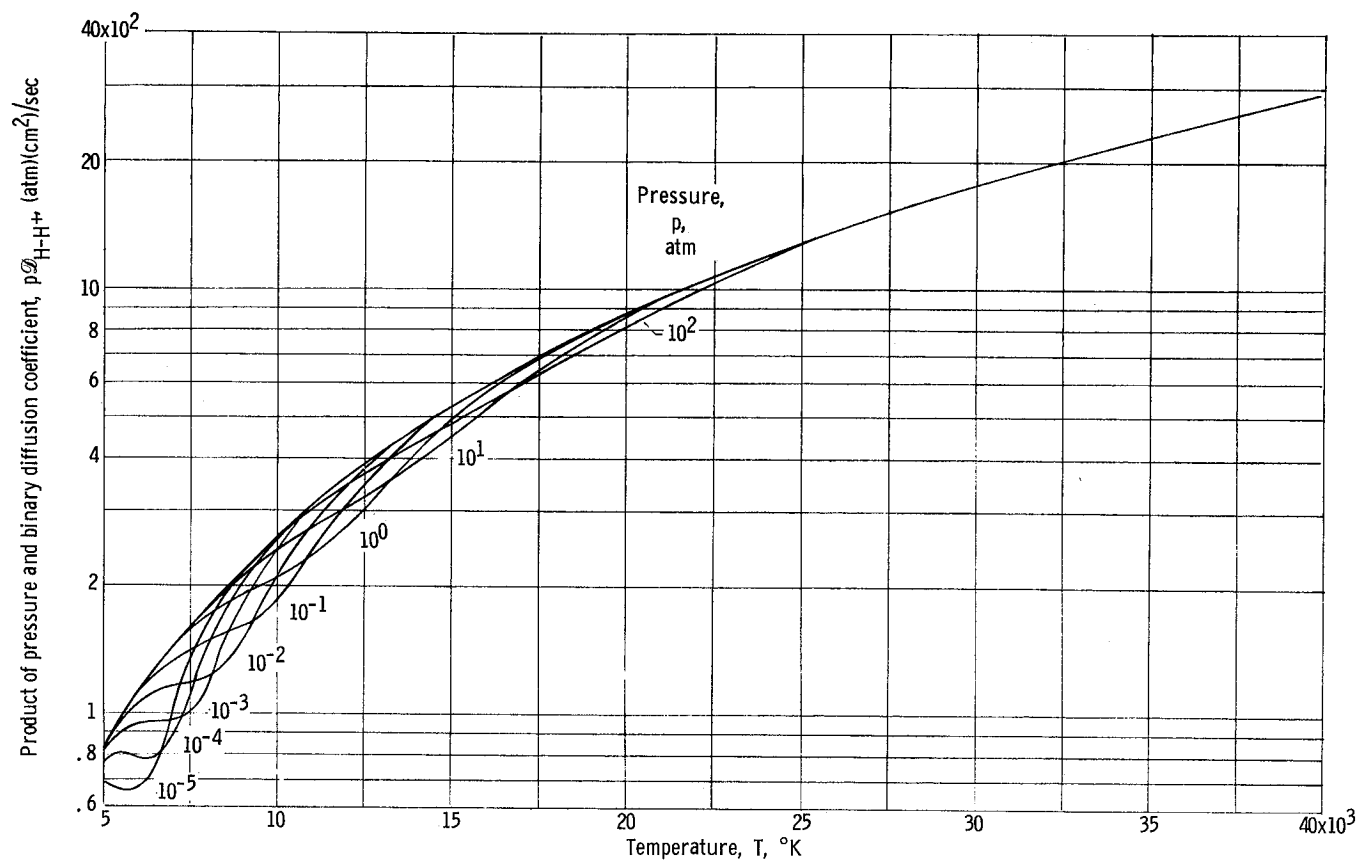
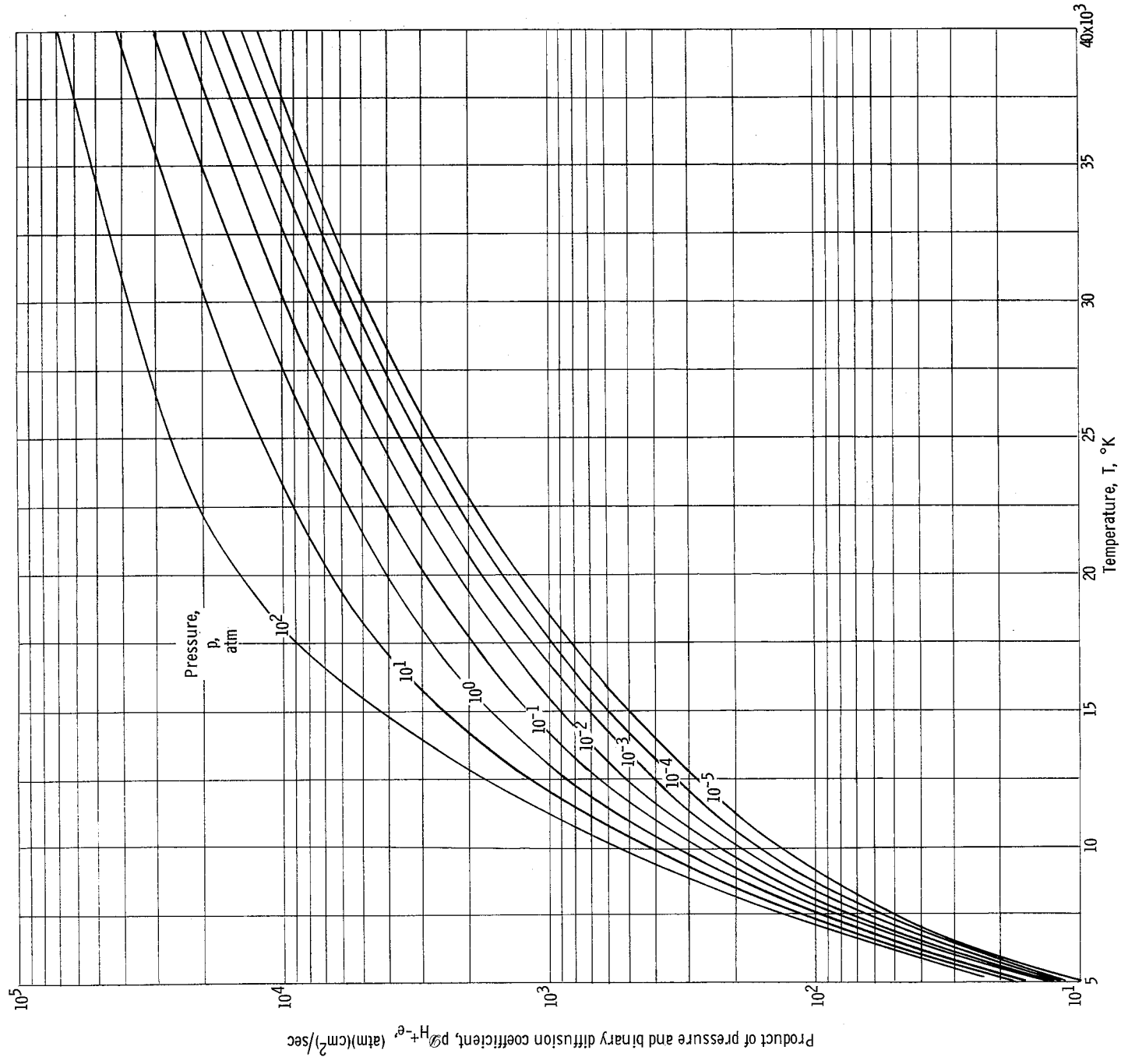


Figure 2. - Illustration of how reference 1 data may be faired into present results. Data for dashed curve was calculated by incorporating both dissociation and ionization. Pressure,  $10^2$  atmospheres.



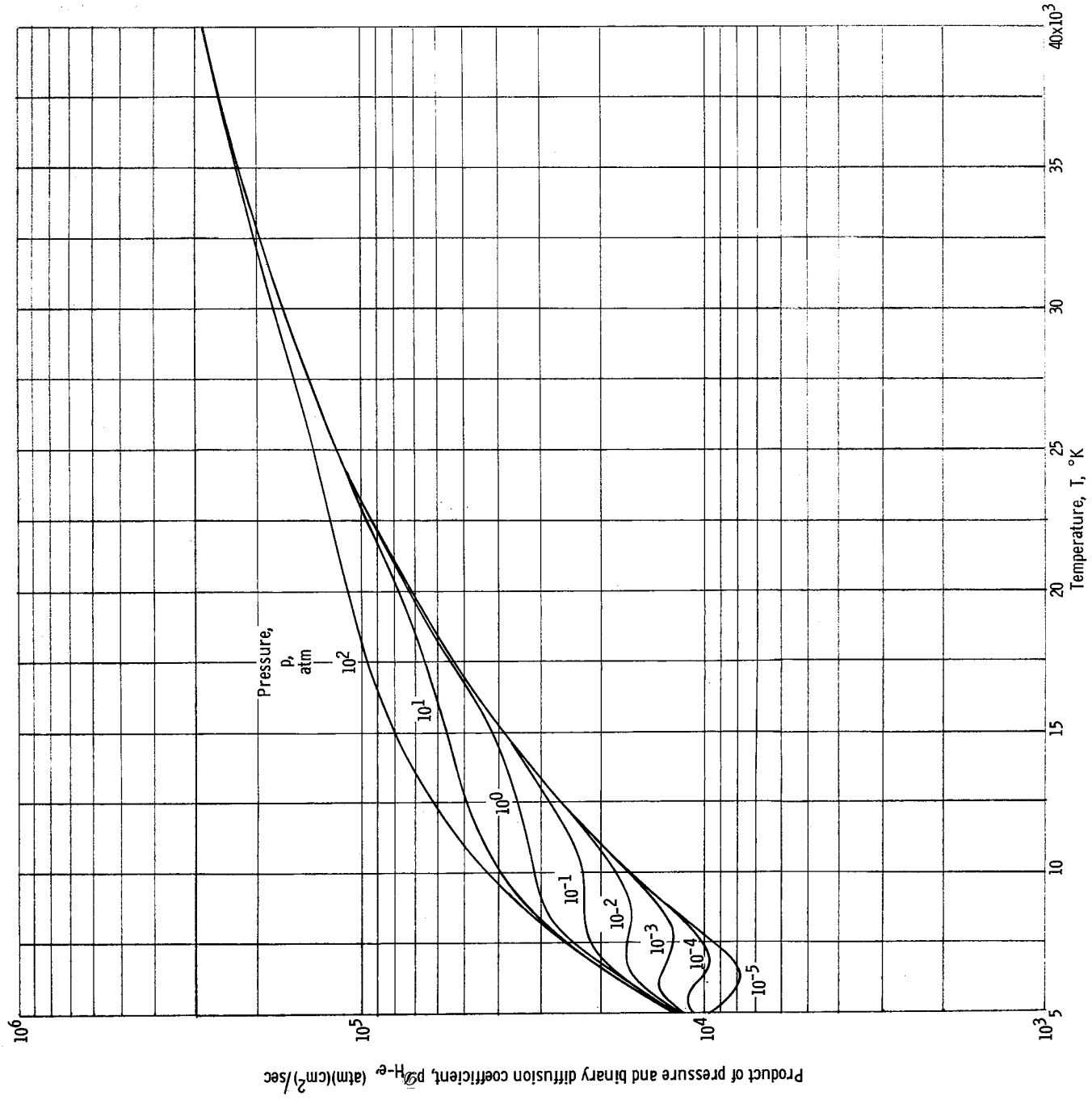
(a) Hydrogen atom - hydrogen ion.

Figure 3. - Product of pressure and binary diffusion coefficient of hydrogen as function of temperature for pressures of  $10^{-5}$  to  $10^2$  atmospheres.



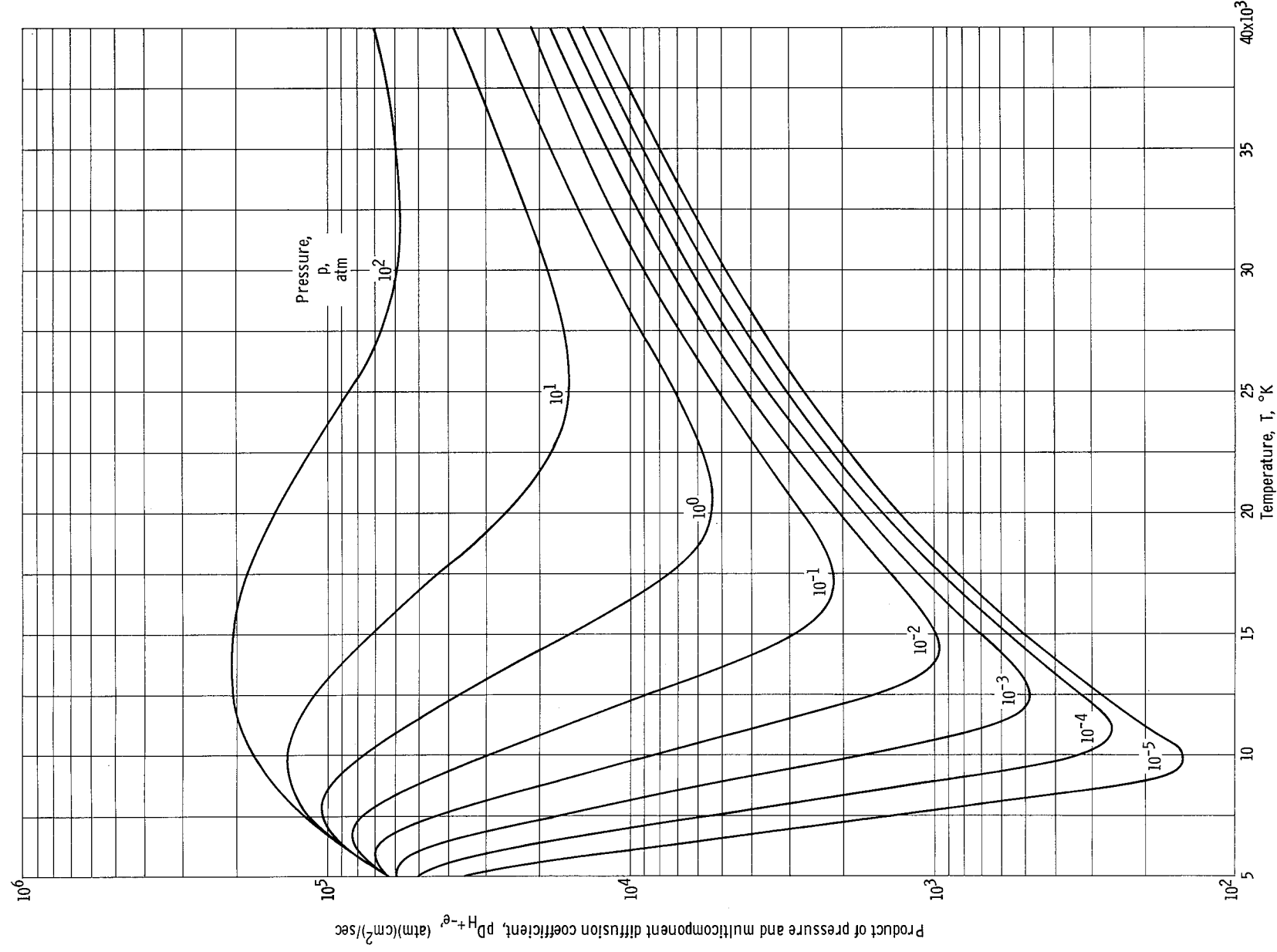
(b) Hydrogen ion - electron.

Figure 3. - Continued.



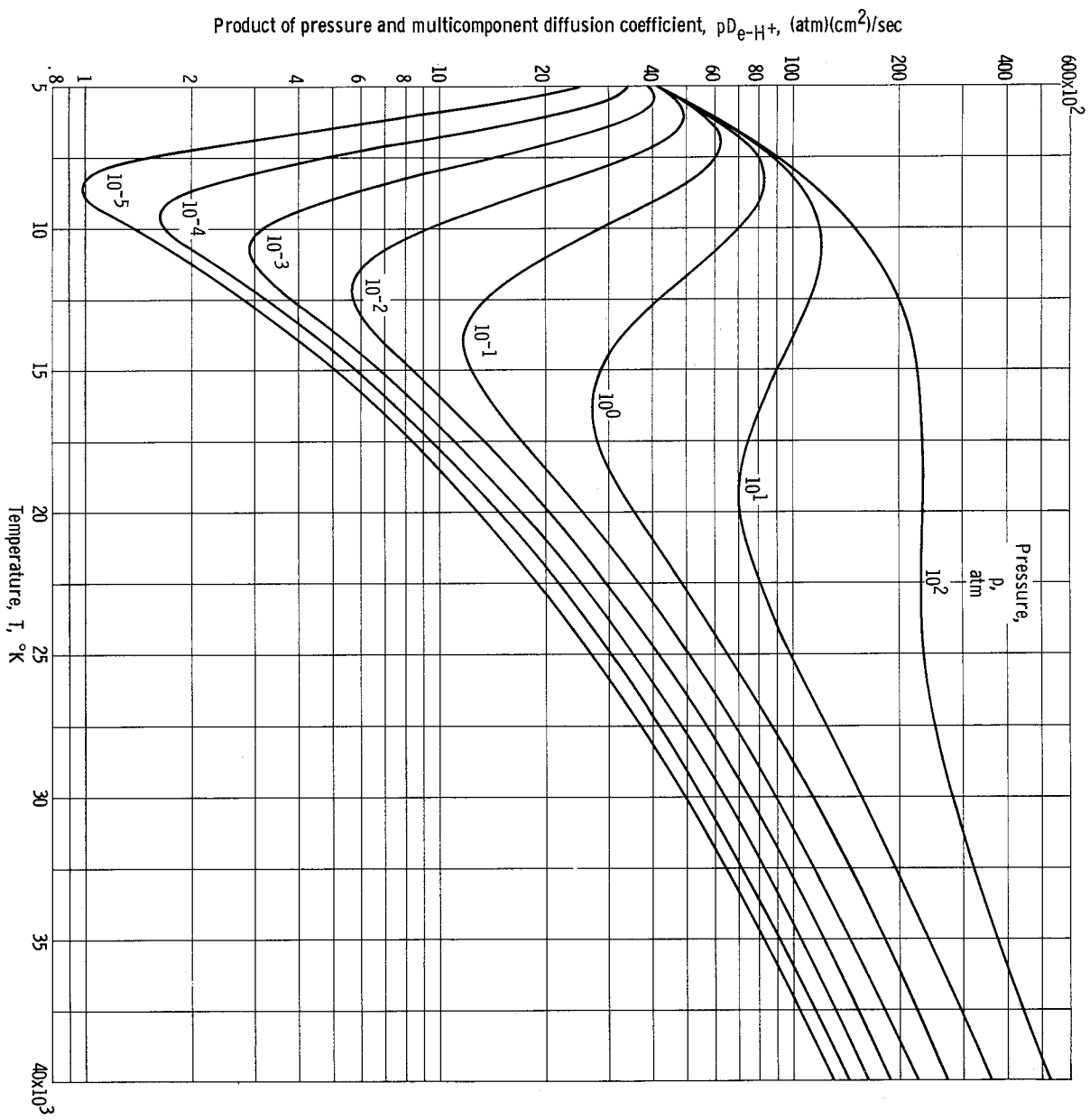
(c) Hydrogen atom - electron.

Figure 3. - Concluded.

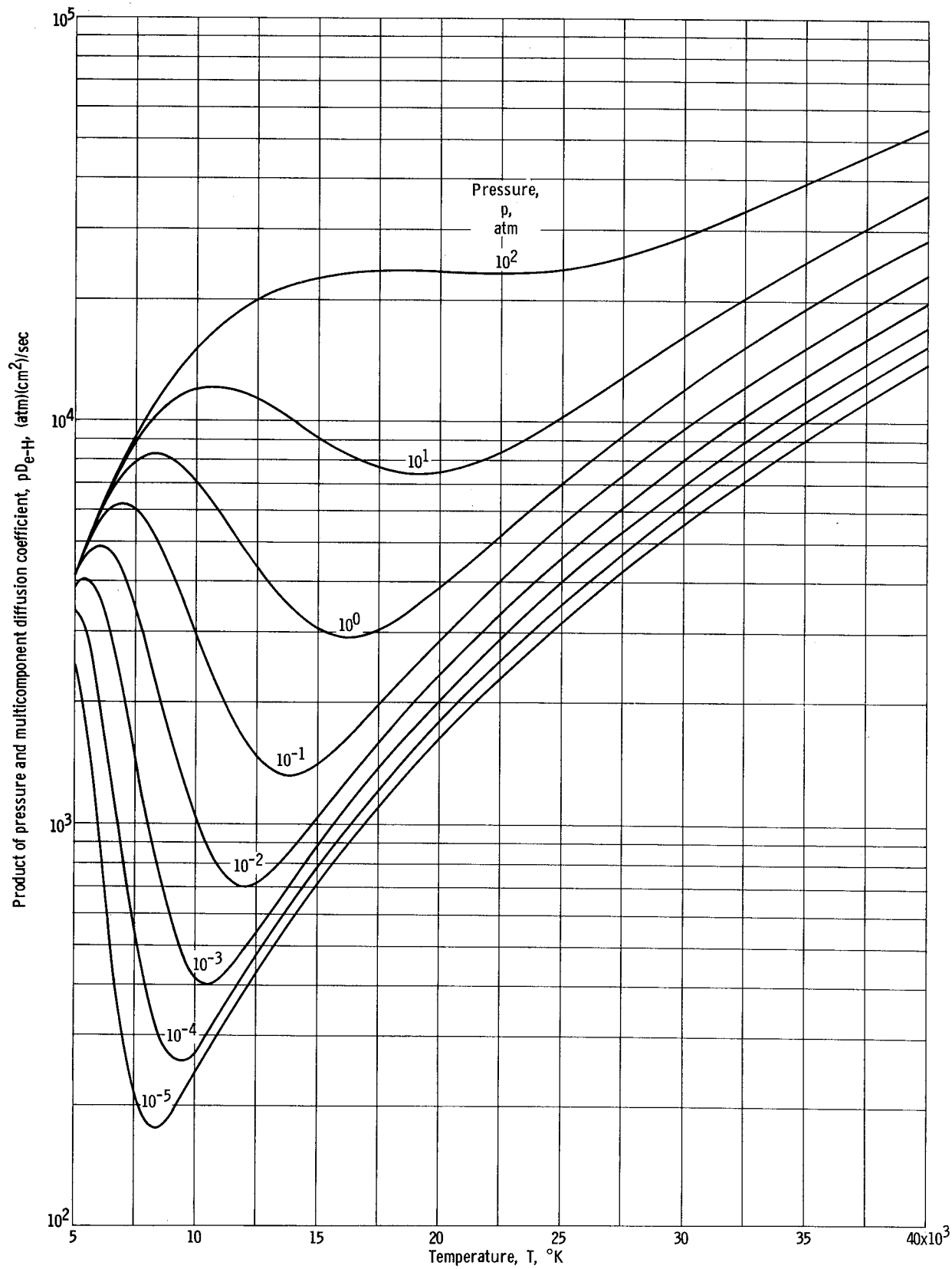


(a) Hydrogen ion - electron.

Figure 4. - Product of pressure and multicomponent diffusion coefficient of hydrogen as function of temperature for pressures from  $10^{-5}$  to  $10^2$  atmospheres.



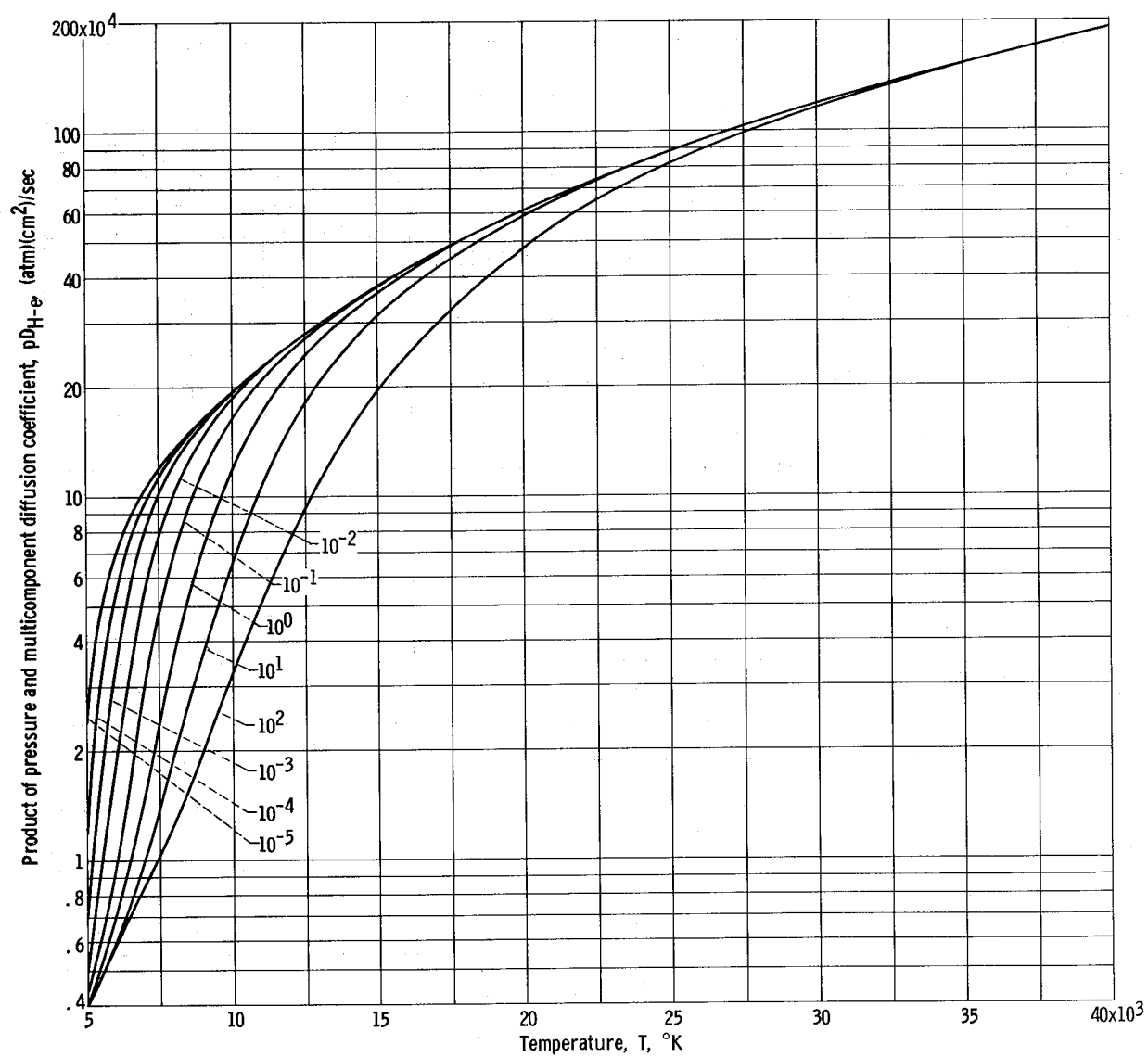
(b) Electron - hydrogen ion.  
Figure 4. - Continued.



(c) Electron - hydrogen atom.

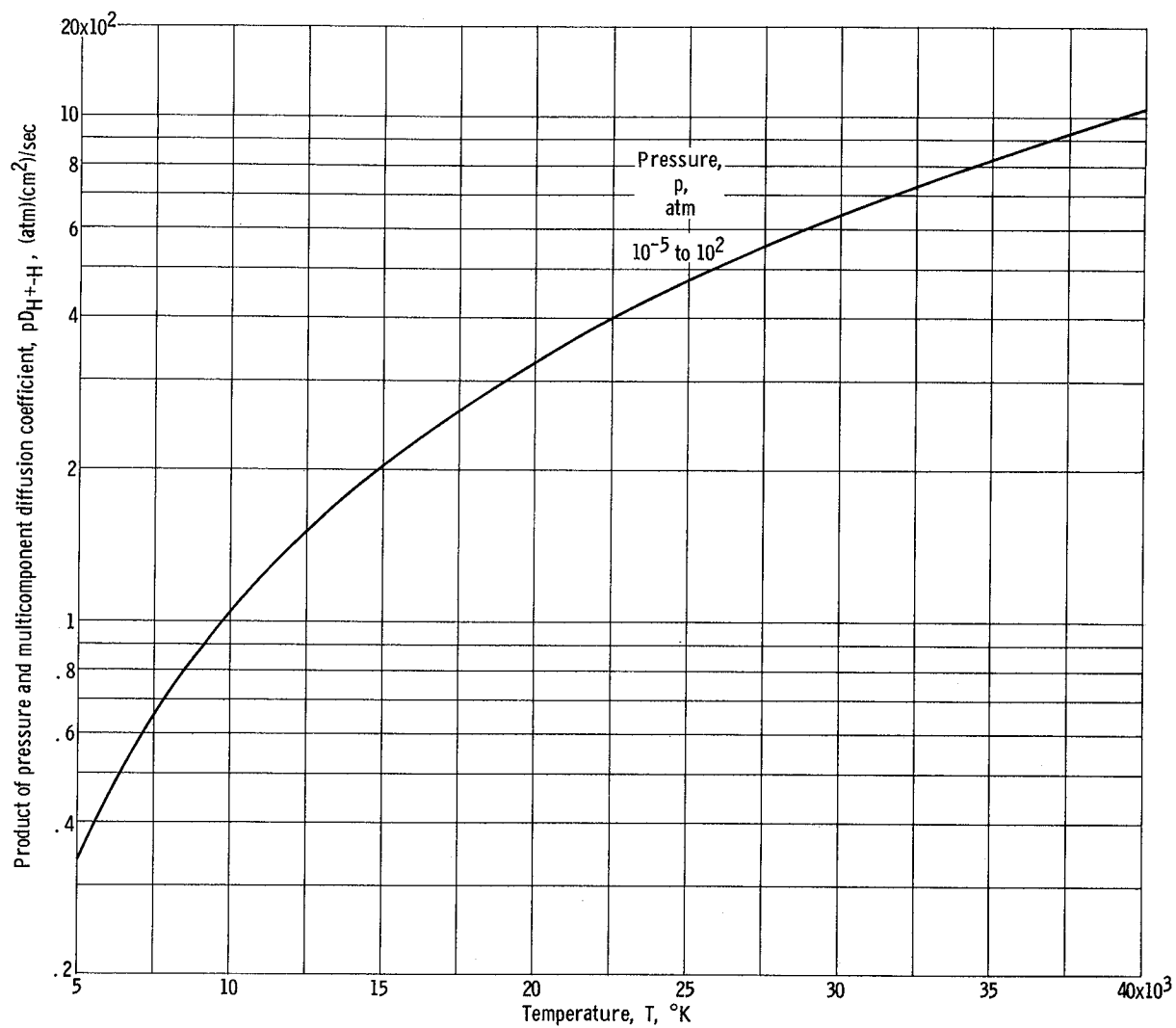
Figure 4. - Continued.





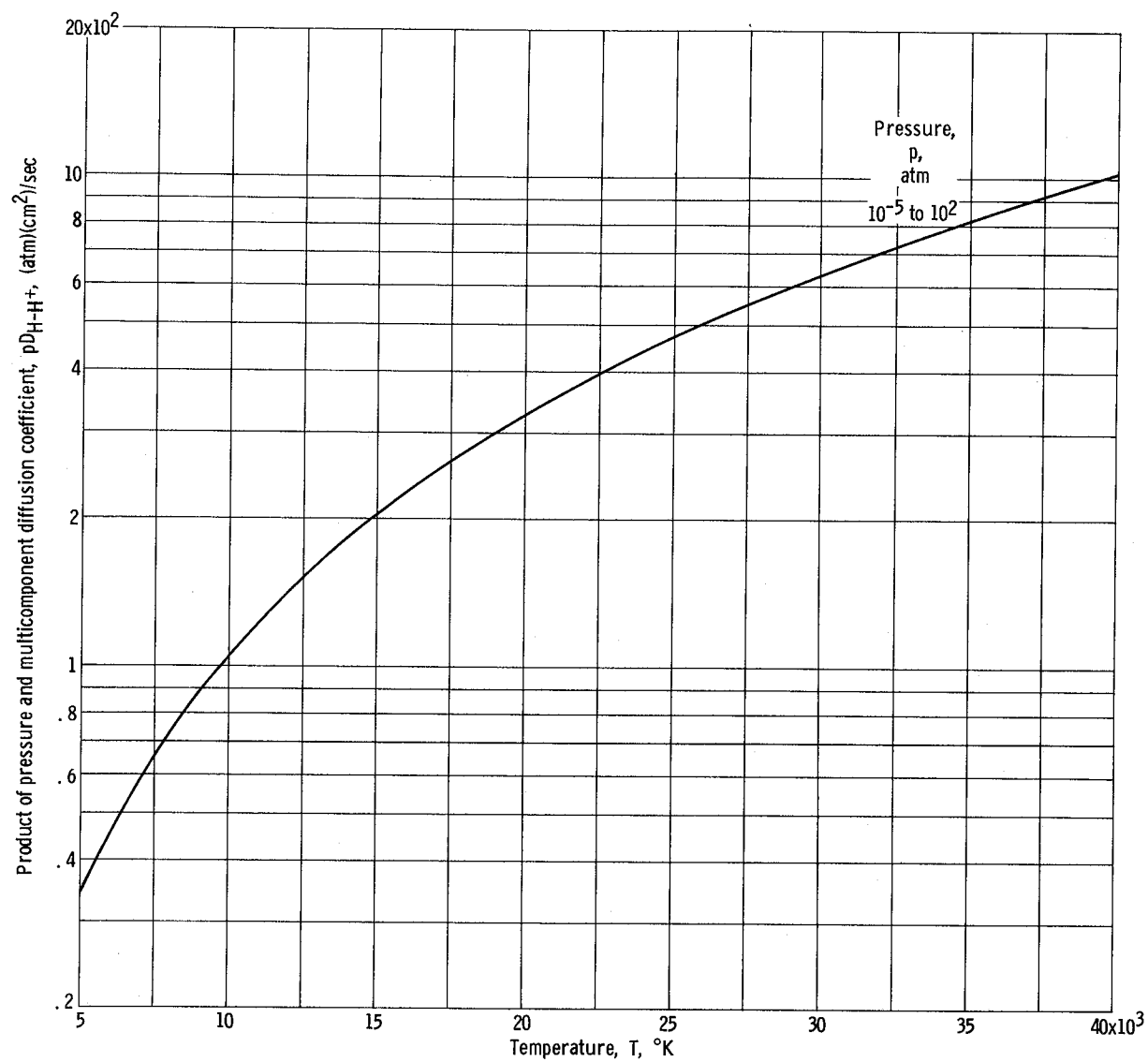
(d) Hydrogen atom - electron.

Figure 4. - Continued.



(e) Hydrogen ion - hydrogen atom.

Figure 4. - Continued.



(f) Hydrogen atom - hydrogen ion.

Figure 4. - Concluded.

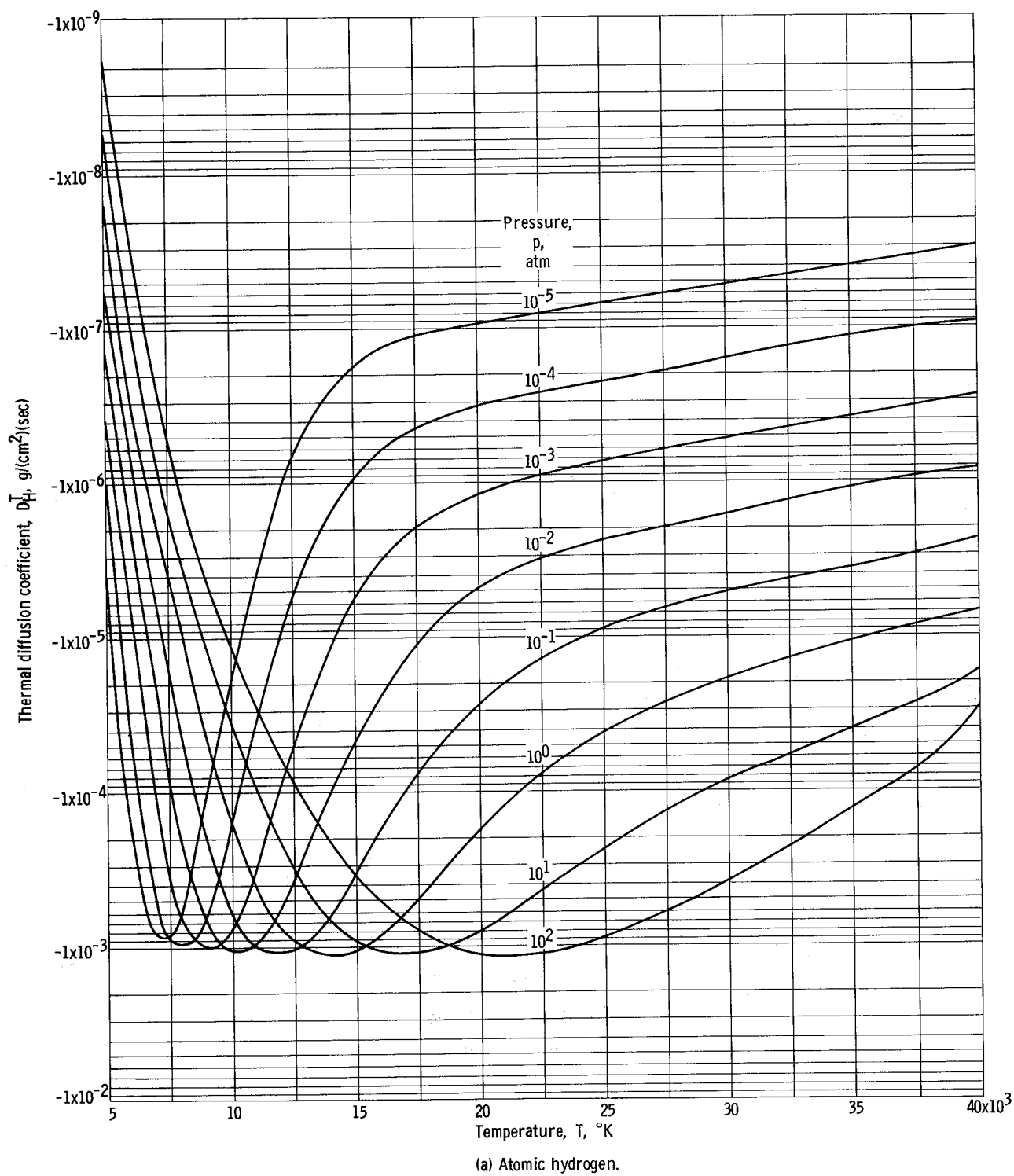
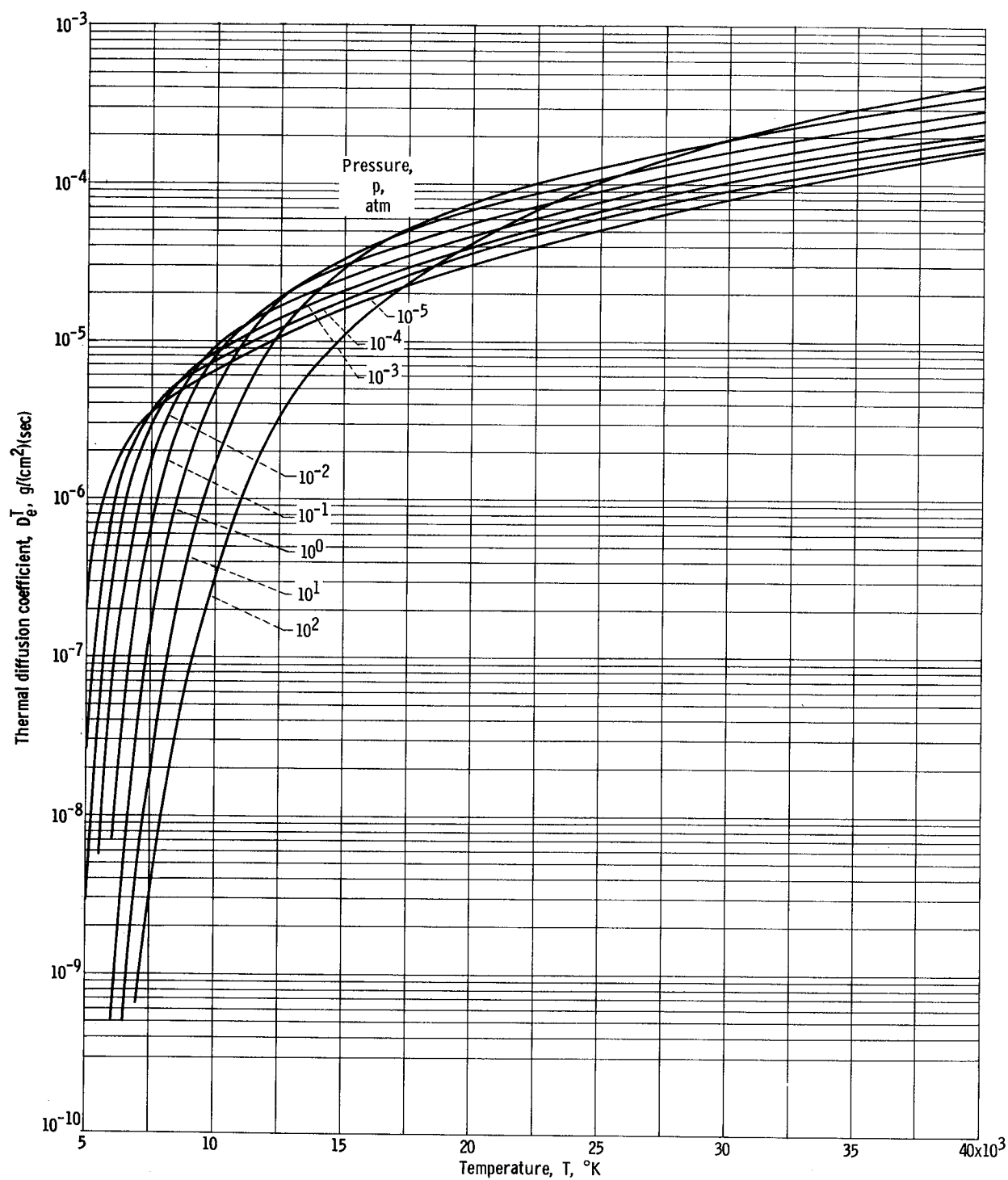
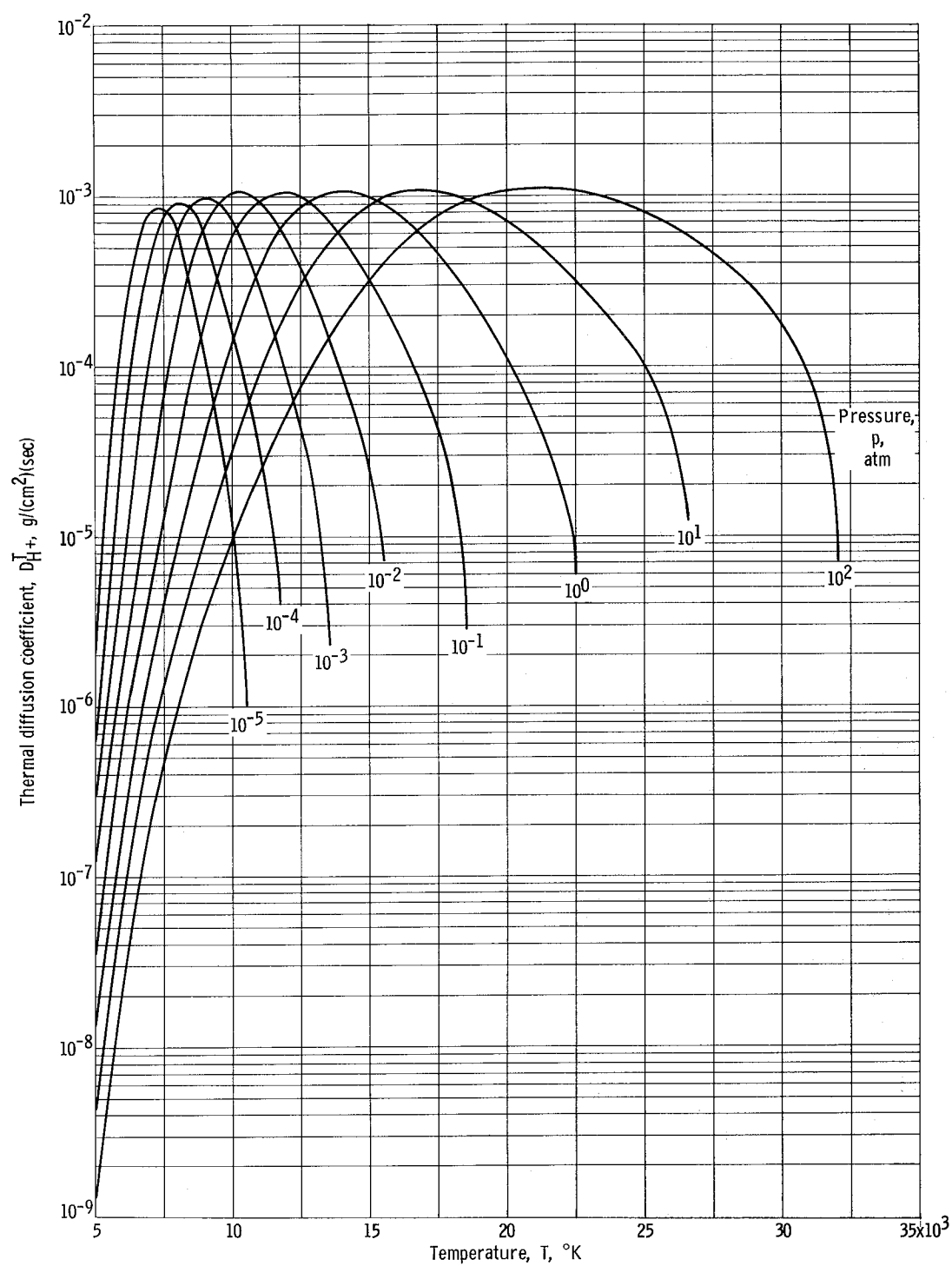


Figure 5. - Thermal diffusion coefficient of atomic hydrogen as function of temperature for pressures from  $10^{-5}$  to  $10^2$  atmospheres.



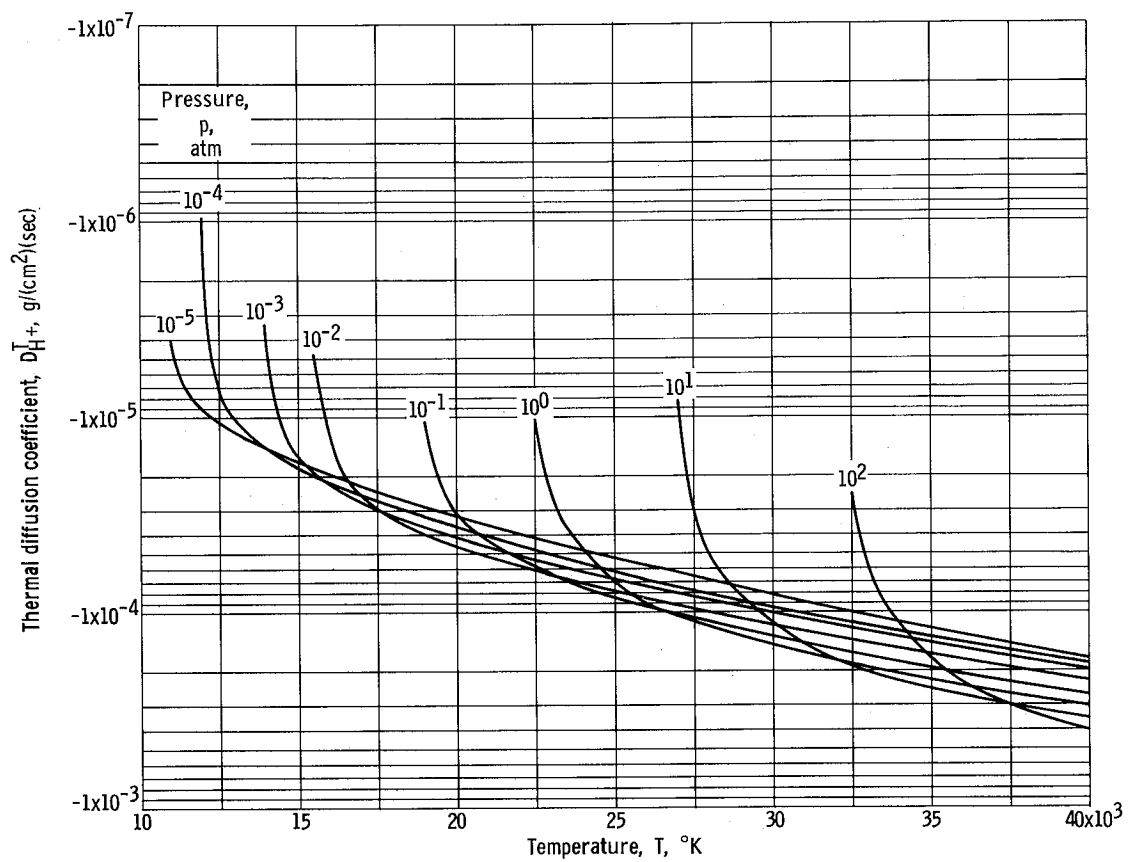
(b) Electron.

Figure 5. - Continued.



(c) Hydrogen ion.

Figure 5. - Continued.



(c) Concluded.

Figure 5. - Concluded.

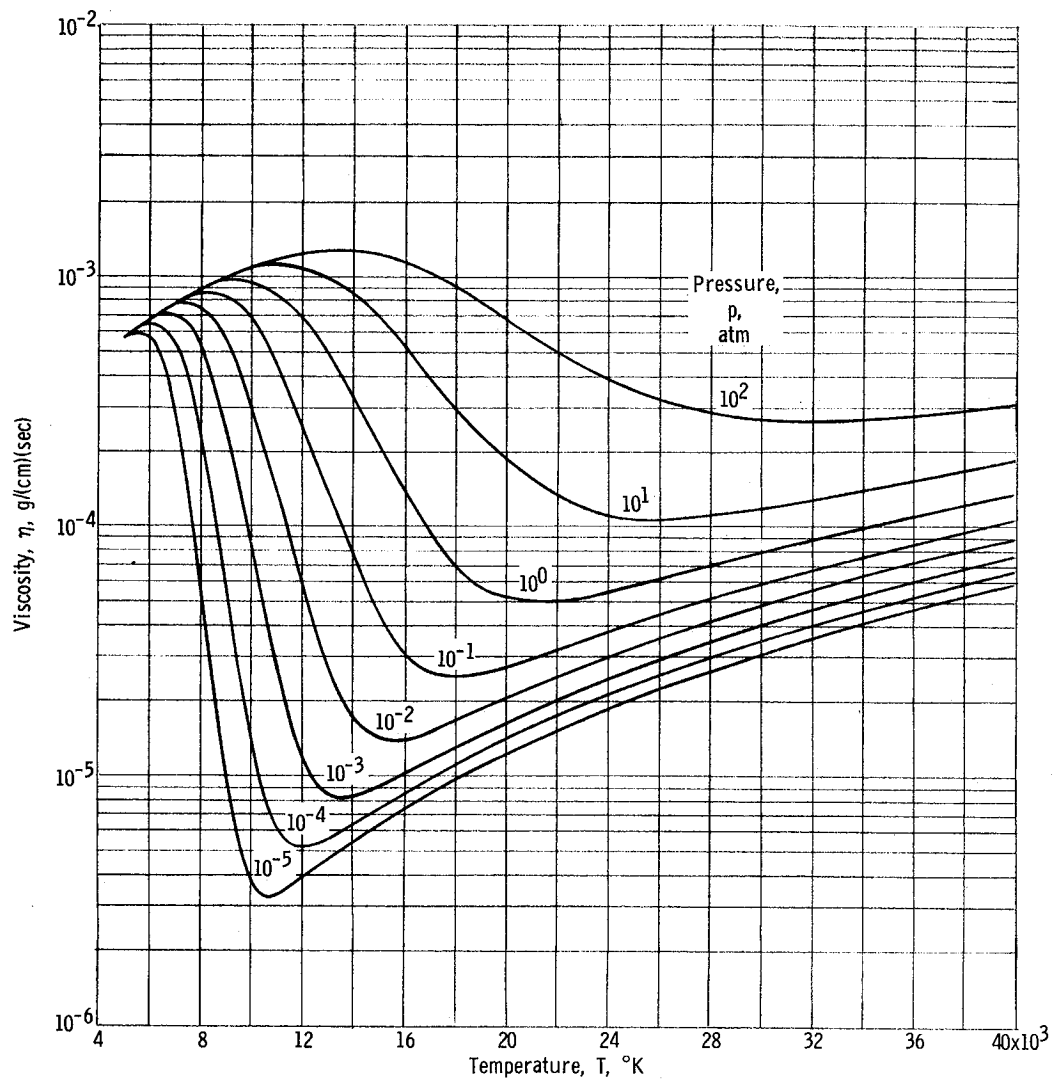


Figure 6. - Viscosity of hydrogen as function of temperature for pressures from  $10^{-5}$  to  $10^2$  atmospheres.



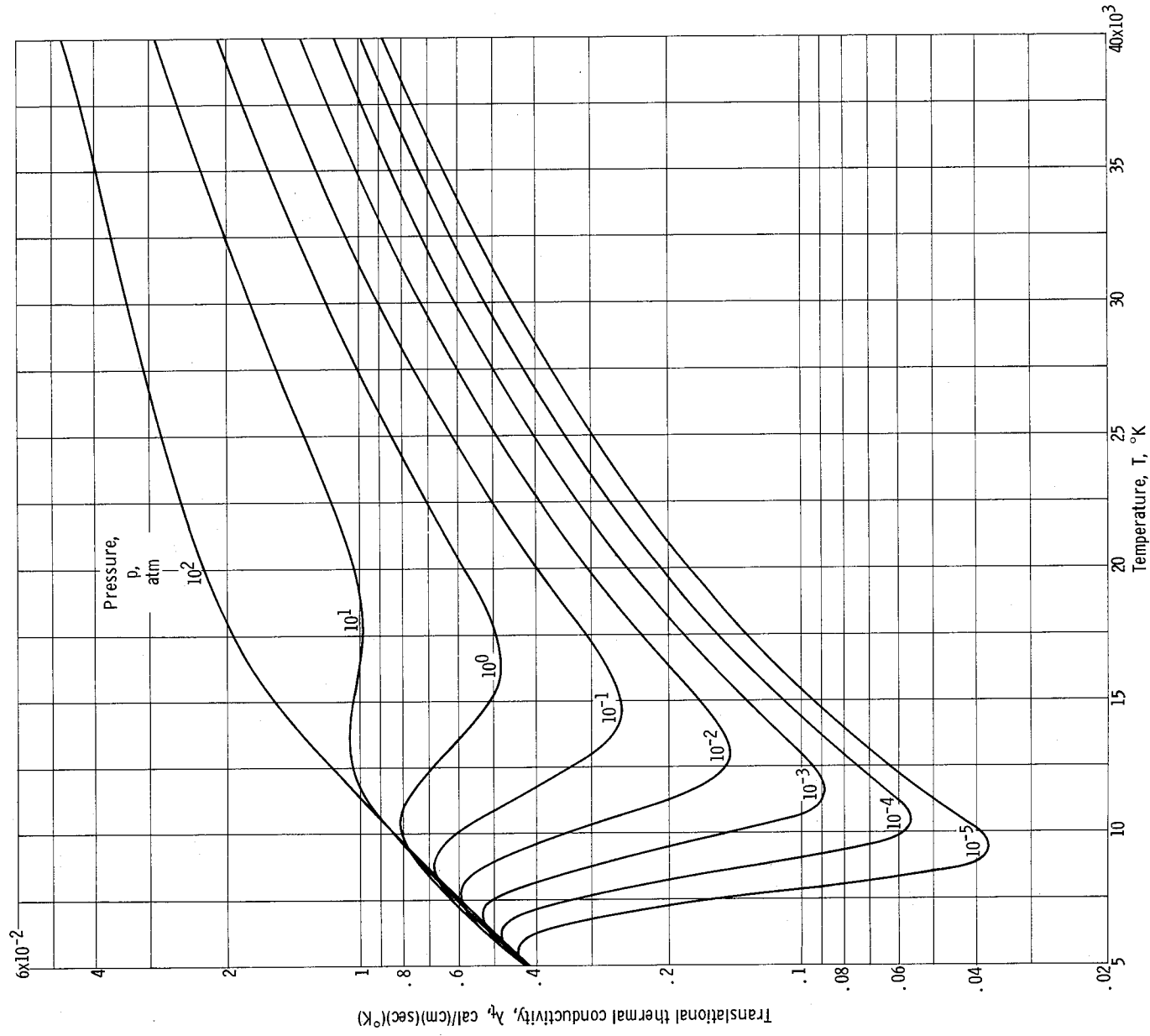


Figure 7. - Translational contribution to total thermal conductivity of hydrogen as function of temperature for pressures from  $10^{-5}$  to  $10^2$  atmospheres.

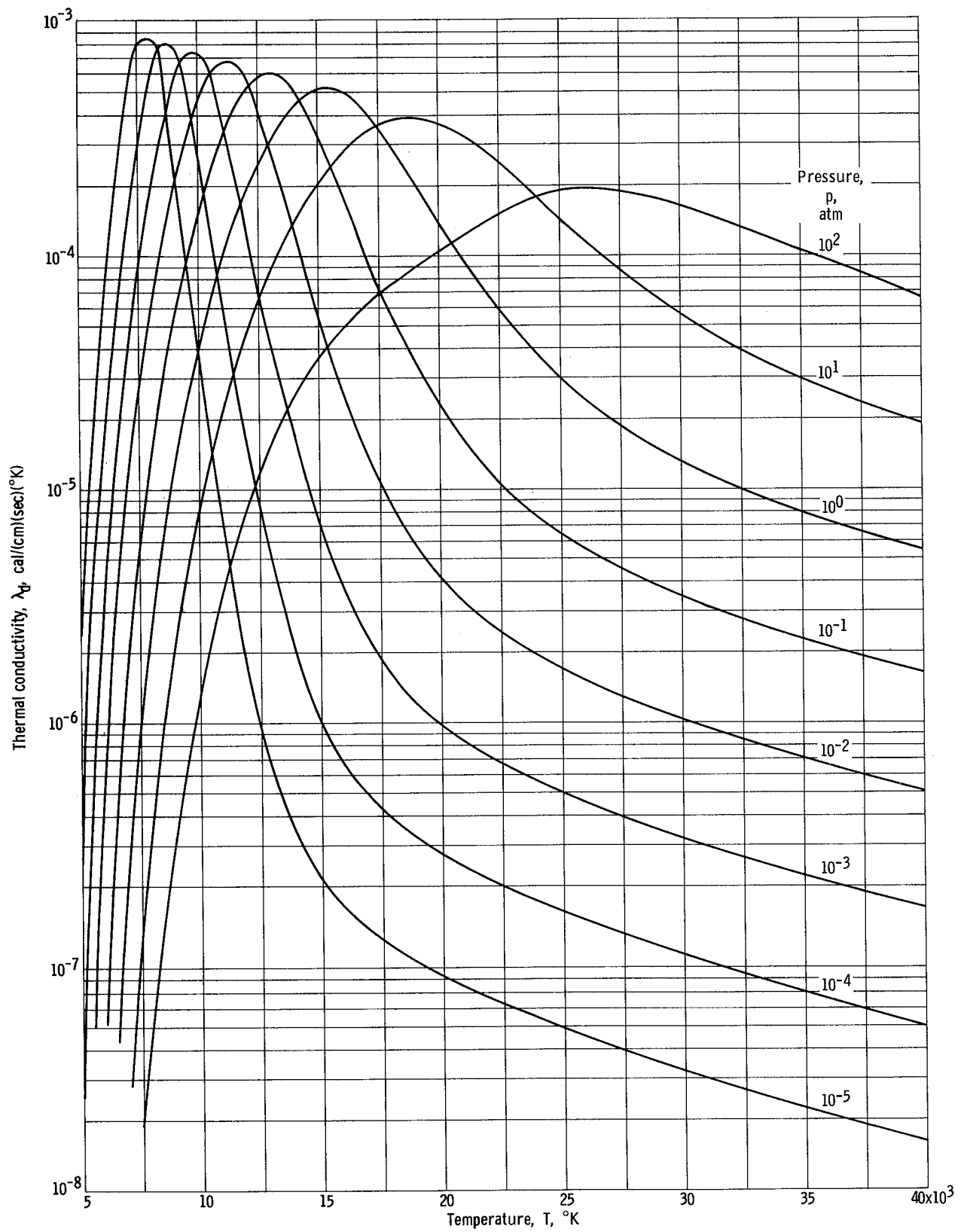


Figure 8. - Contribution  $\lambda_d$  to total thermal conductivity as function of temperature for pressures from  $10^{-5}$  to  $10^2$  atmospheres.

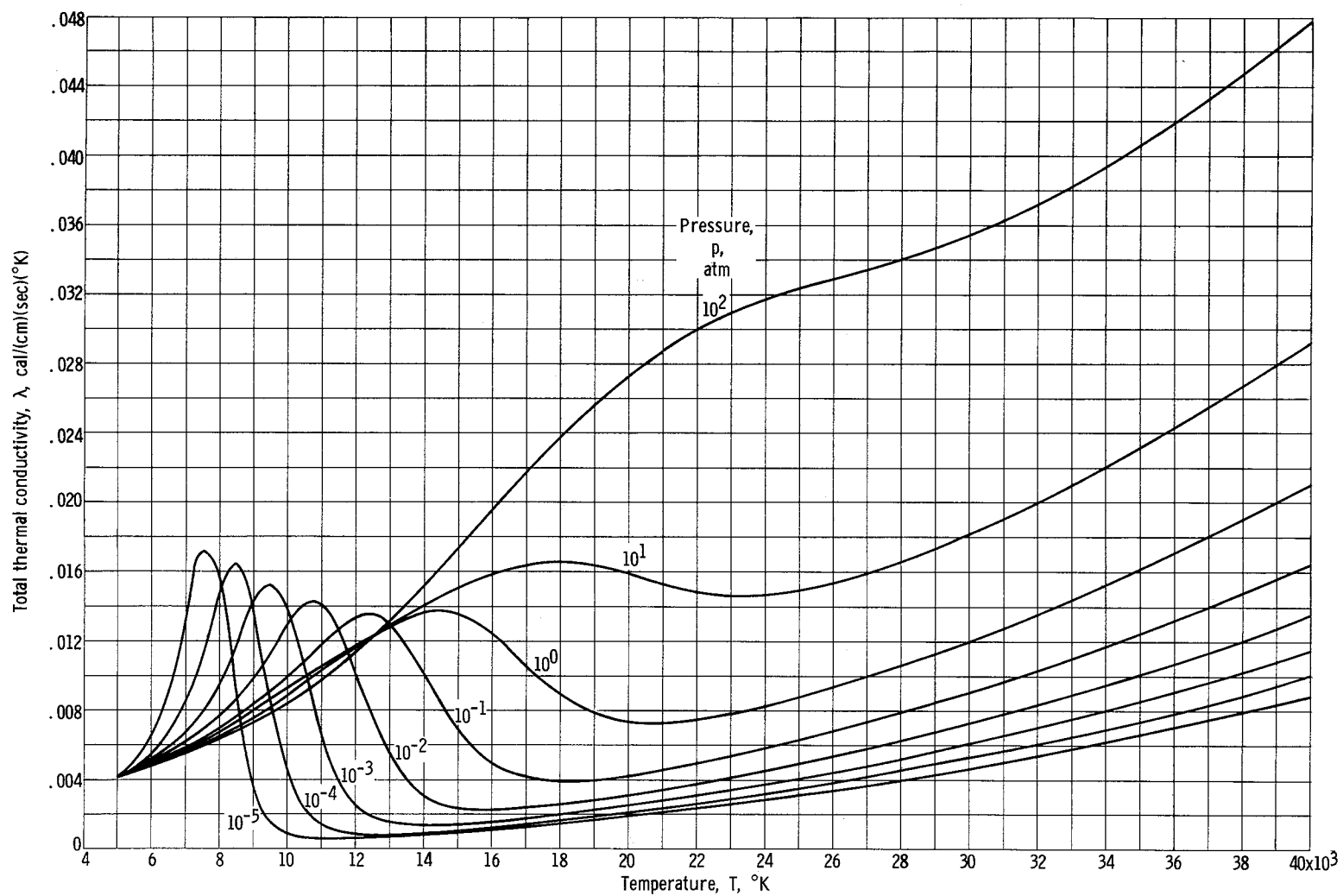


Figure 9. - Total thermal conductivity as function of temperature for pressures from  $10^{-5}$  to  $10^2$  atmospheres.

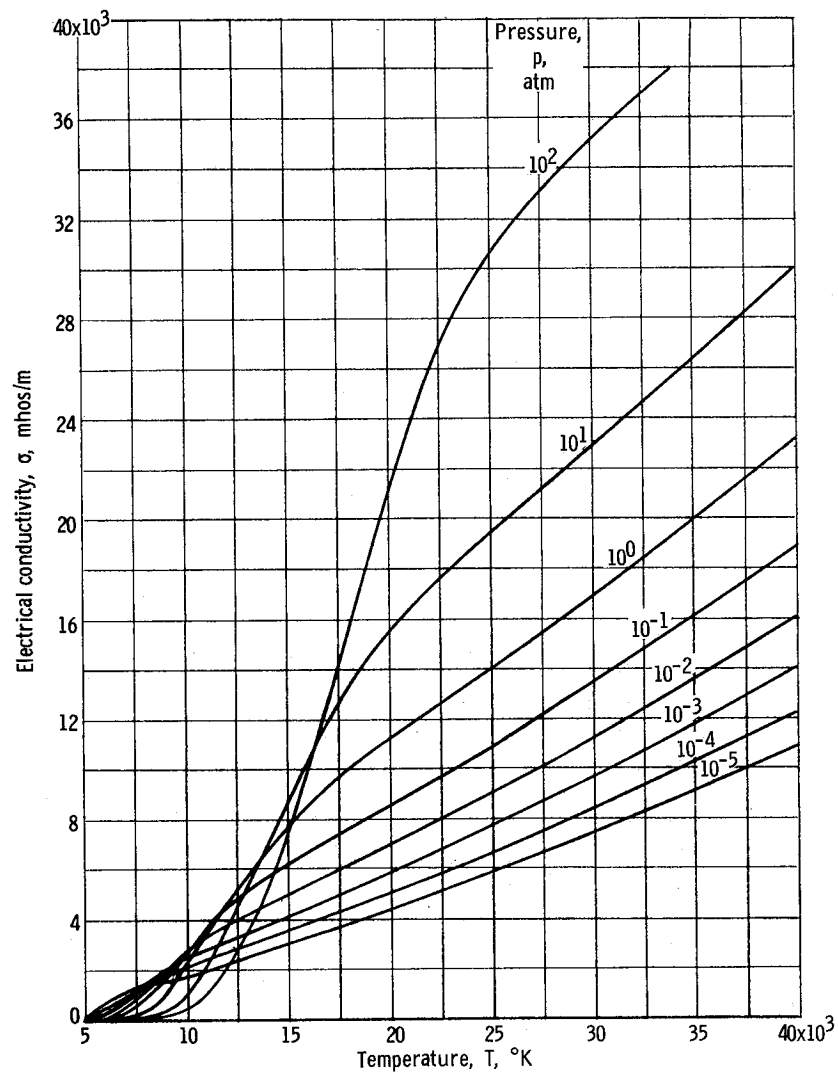


Figure 10. - Electrical conductivity of ionizing atomic hydrogen as function of temperature for pressures from  $10^{-5}$  to  $10^2$  atmospheres.

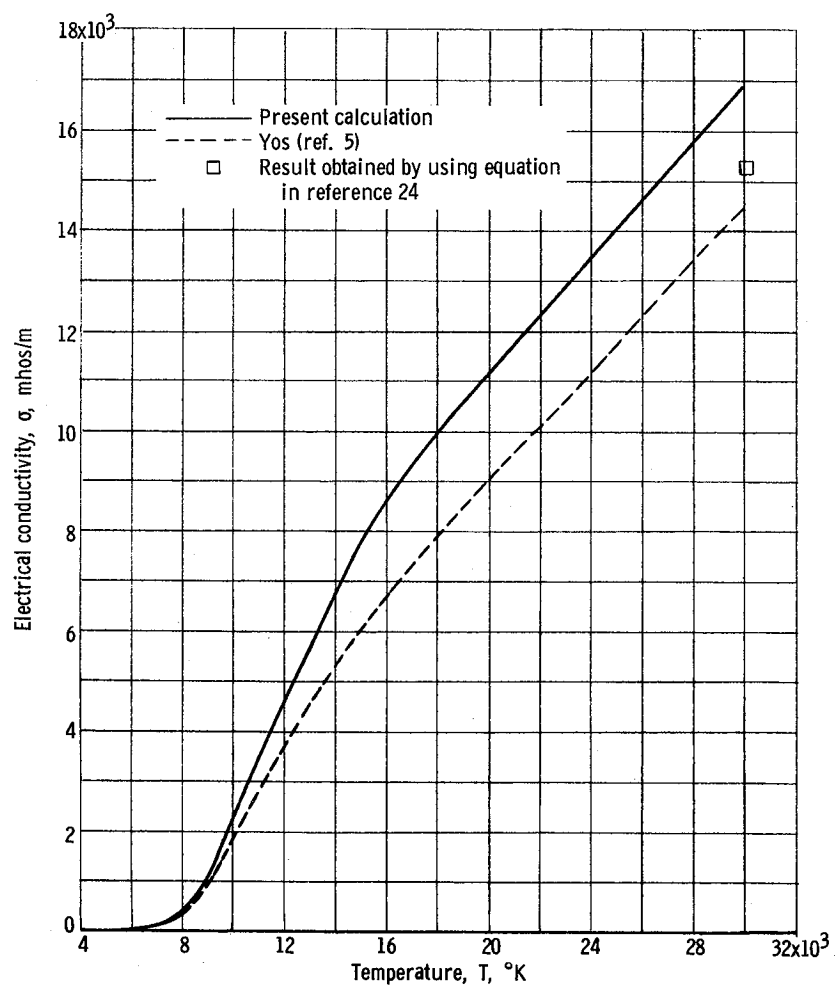


Figure 11. - Comparison of present calculation of electrical conductivity of hydrogen with that of reference 5. Pressure, 1 atmosphere.

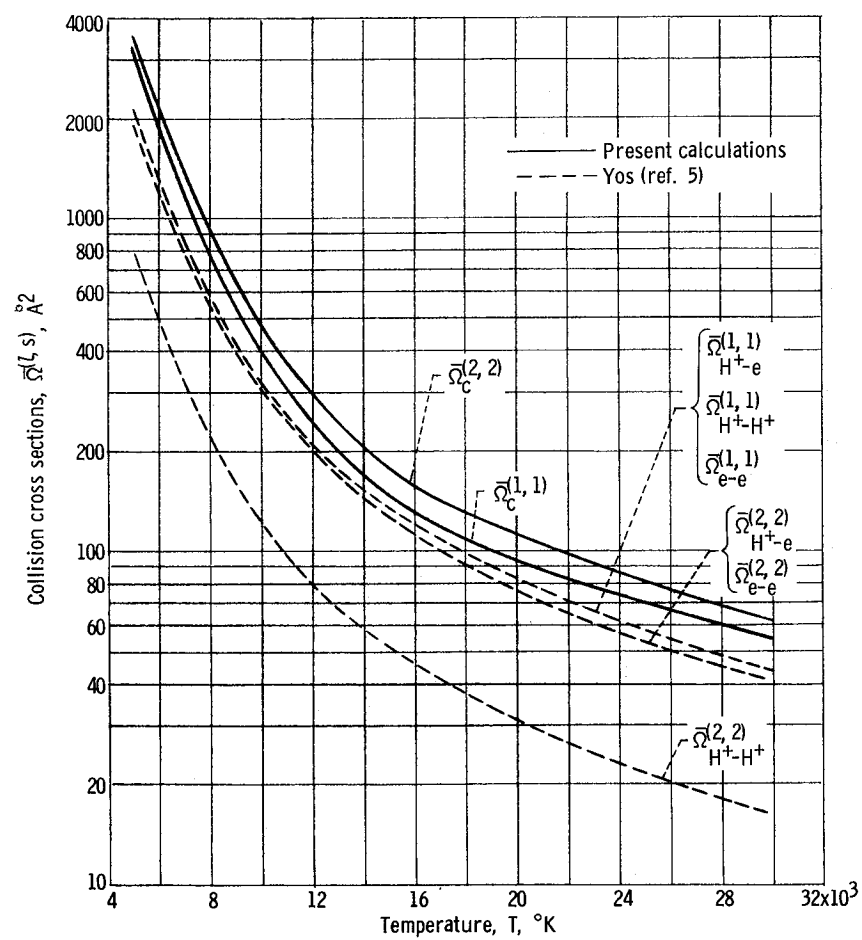


Figure 12. - Comparison of coulombic collision cross sections used in present calculations with those of Yos (ref. 5).

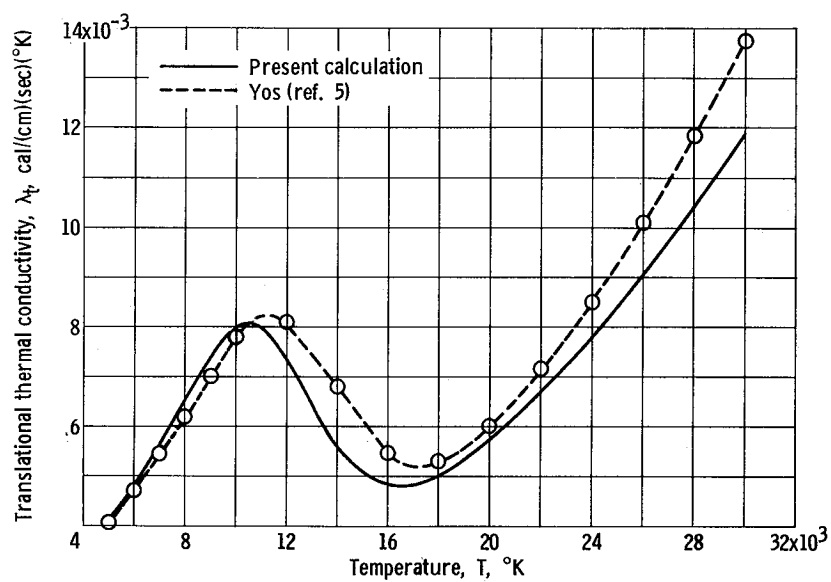


Figure 13. - Comparison of translational thermal conductivity of present calculation with that of reference 5. Pressure, 1 atmosphere.

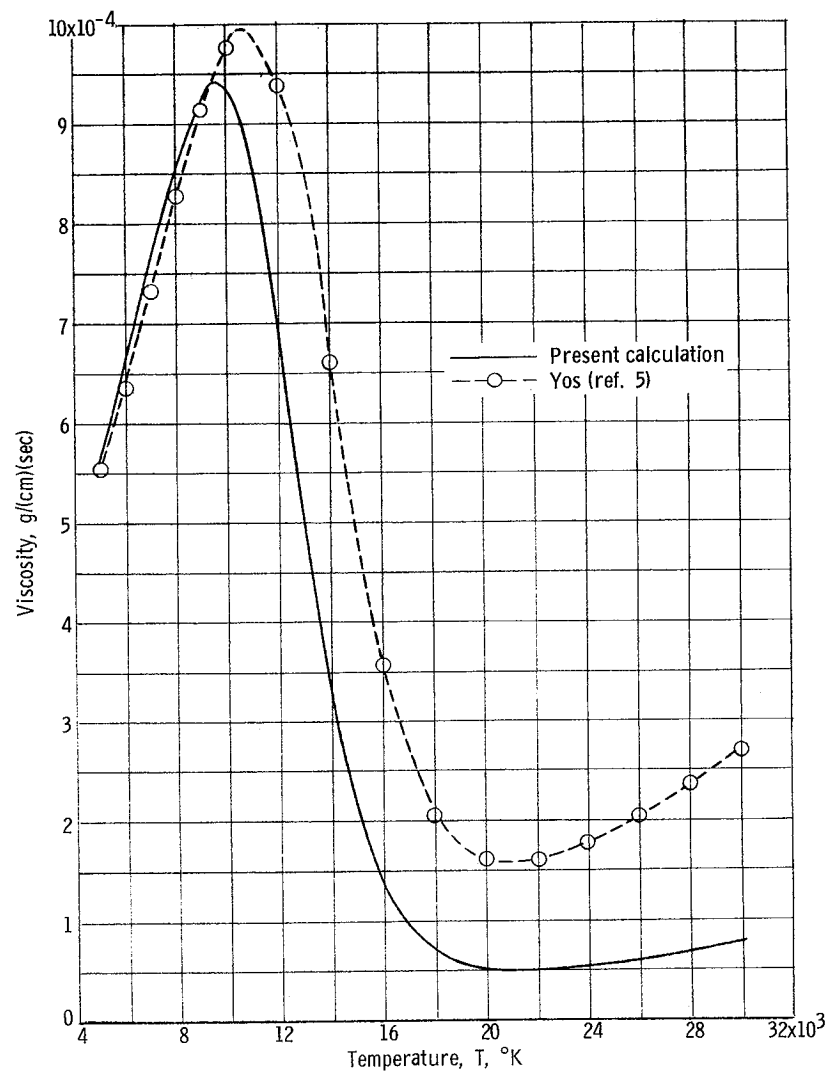


Figure 14. - Comparison of viscosity of present calculation with that of reference 5. Pressure, 1 atmosphere.



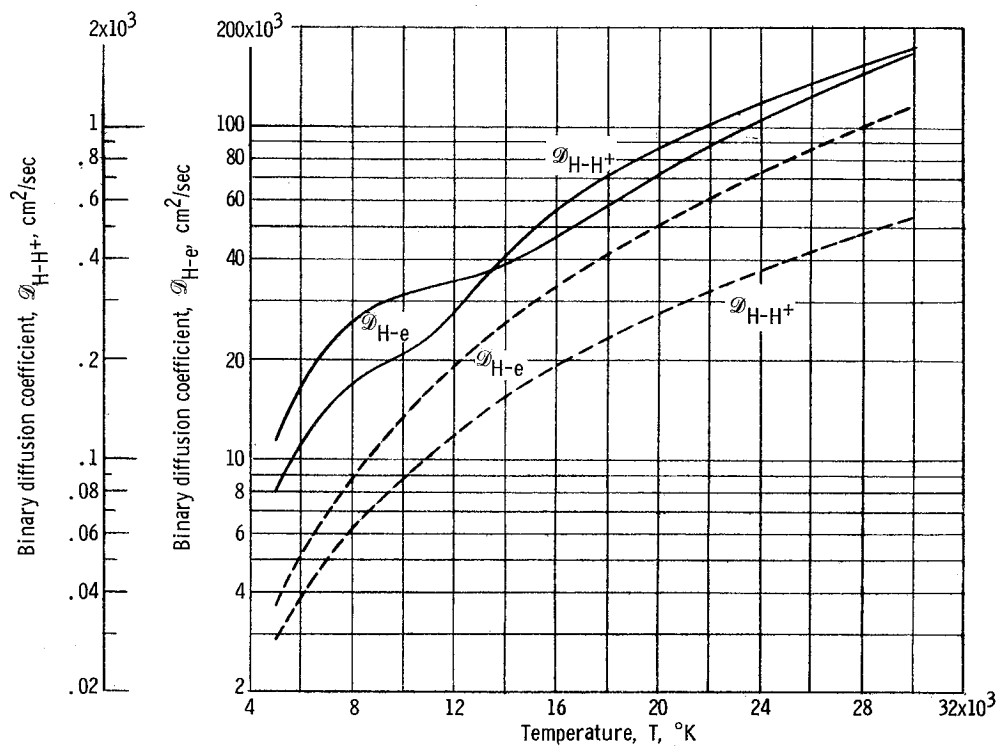


Figure 15. - Comparison of atom-ion and atom-electron binary diffusion coefficients of present calculation with those of reference 5. Pressure, 1 atmosphere.

